SIEMENS

LEONARDO syngo 2004A

SW

DICOM Conformance Statement

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History of released Versions

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Introduction to Template

0.1 Purpose

The DICOM Conformance Statement (DCS) is supplied here as a complete document for all Services including Offline Media Storage Services. It is supplied as a development document ("Functional Specification DICOM") including traceable requirements. The Product Version of the individual product DCS will be derived from this document.

This Conformance Statement is a "Development Level Version".

That means there may be open points and unspecified terms (e.g. xxxxx) mentioned that will be solved during the development phases. The release for product "Product Level Version" will no longer contain any of these above mentioned open points or unspecific terms.

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0.2 Structure

The Multimodality Workstation (Med-WS) Conformance Statement Template is subdivided into three Parts which relate to individual documents needed to declare Conformance according to the requirements of "Part 2 - Conformance" of the DICOM Standard.

Those parts are:

- "DICOM Conformance Statement" for Network related Services
- An privately defined "Application Profile"
- and the "Offline Media Conformance Statement" to support local archive media.
- A general Annex.

0.3 Usage

The template shall be used to create the necessary conformance documents for a specific product based on the Med-WS (DICOM) application.

Therefore all occurrences of e.g. <..product...> need to replaced by the actual meaning for a certain product.

Sections describing a e.g. "Med-WS DICOM application" should not need a product specific change since they describe a behavior which is planned to be common between all Med-WS-based products.

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Network Conformance Statement

This part contains the Conformance declaration for the DICOM Network Services:

- Storage - User/Provider (includes Verification - User/Provider)
- Storage Commitment (Push Model) - User/Provider
- Query/Retrieve - User/Provider
- Basic Grayscale/Color Print - User

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1 Introduction

1.1 Purpose

This DICOM Conformance Statement is written according to part PS 3.2 of [1].

The applications described in this conformance statement are part of the SIEMENS Multimodality-Workstation (Med-WS) products based on *syngo*® software[1]. The Med-WS DICOM network implementation acts as SCU and SCP for the DICOM Storage, Storage Commitment and Query/Retrieve services and as SCU for the DICOM Print. Verification is supported in SCU(service) and SCP role.

1.2 Scope

This DICOM Conformance Statement refers to Siemens Med-WS based products using Multimodality Workstation software applications. The following table relates Med-WS software names to SIEMENS product.

Table 1: *Siemens Med-Workstation DICOM Products*

Software Name	Siemens Med-WS Product
VB30A	Multi modality Workstation LEONARDO 2003A

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1.3 Definitions, Abbreviations

1.3.1 Definitions

DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element with Composite information objects

1.3.2 Abbreviations

ACR	American College of Radiology
AE	DICOM Application Entity
ASCII	American Standard Code for Information Interchange
Med-WS	Multimodality-Workstation
CSE	Customer Service Engineer
DB	Database

1. *syngo* is a registered trademeark of Siemens AG

DCS	DICOM Conformance Statement
DSA	Digital Subtraction Angiography
IIDC	Image-intensifier Distortion Correction
IOD	DICOM Information Object Definition
ISO	International Standard Organization
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
RIS	Radiology Information System
RWA	Real-World Activity
SCU	DICOM Service Class User (DICOM client)
SCP	DICOM Service Class Provider (DICOM server)
SOP	DICOM Service-Object Pair
U	Unique Key Attribute

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1.4 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-15, 2000

1.5 Connectivity and Inter-operability

This Conformance Statement by itself does not guarantee successful inter-operability of Siemens equipment with non-Siemens equipment. The user (user's agent) should be aware of the following issues:

- Inter-operability

  Inter-operability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a networked environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee inter-operability of Siemens equipment with non-Siemens equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates Siemens equipment with non-Siemens equipment.

- Validation

  Siemens equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where Siemens equipment is linked to non-Siemens equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation test will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- New versions of the DICOM Standard

  the DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. Siemens is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do so, Siemens reserves the right to make changes to its products or to discontinue its delivery. The user should ensure that any non-Siemens provider linking to Siemens equipment, also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into Siemens equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

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2 Implementation Model Verification

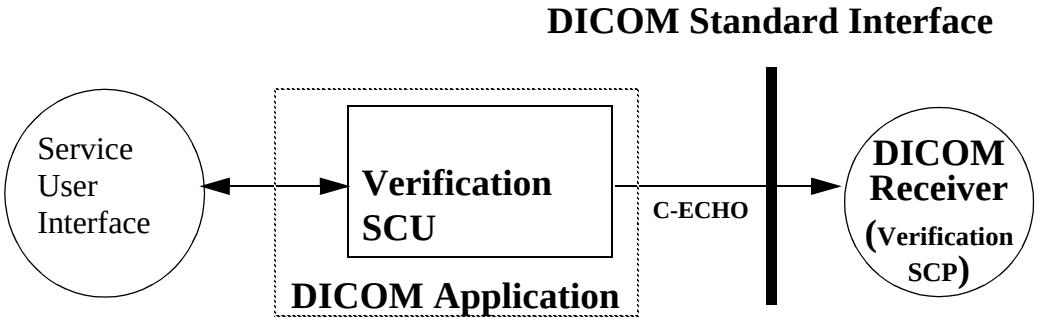
The Siemens Med-WS DICOM Service Tool application requests Verification to verify the ability of a foreign DICOM application on a remote node to respond to DICOM messages.

Responding to Verification requests from remote nodes is handled by the Storage SCP application.

2.1 Application Data Flow Diagram

The Med-WS DICOM network implementation is a Windows NT application and acts as SCU for the C-ECHO DICOM network service.

Figure 1: *Application Data Flow Diagram - Verification SCU*



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2.2 Functional Definitions of Application Entities

The Siemens Med-WS DICOM Service Tool application opens an association when a "Test" of a remote application is requested during a configuration session. This can be done when entering new data for remote application configuration or to verify existing configuration data.

2.3 Sequencing of real World Activities

Newly entered data have to be saved first, before a "test" of these data is possible.

3 AE Specification Verification

3.1 Verification AEs Specification

3.1.1 Association Establishment Policies

3.1.1.1 General

The Siemens Med-WS DICOM Service Tool application attempts to open an association for verification request whenever the "Test" function is activated during network configuration of a remote DICOM application.

3.1.1.2 Number of Associations

The Siemens Med-WS DICOM Service Tool application initiates one association at a time to request verification.

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3.1.1.3 Asynchronous Nature

The Siemens Med-WS DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

3.1.1.4 Implementation Identifying Information

The Siemens <product> DICOM software provides a single Implementation Class UID of

- 1.3.12.2.1107.5.99.2

and an Implementation Version Name of

- "SIEMENS_LEOVB30B"

The <SW-Version> string is defined by the installed SW.

3.1.2 Association Initiation Policy

The Siemens Med-WS DICOM Service Tool application attempts to initiate a new association for

- DIMSE C-ECHO

service operations.

3.1.2.1 Associated Real-World Activity - Verification

3.1.2.1.1 Associated Real-World Activity -Request Verification "Test"

The associated Real-World activity is a C-ECHO request initiated by Service and Configuration SW environment whenever a "Test" is requested. If an association to a remote Application Entity is successfully established, Verification with the configured AET is requested via the open association. If the C-ECHO Response from the remote Application contains a status other than "Success" this will be indicated in the service environment and the association is closed.

3.1.2.1.2 Proposed Presentation Contexts

The Siemens Med-WS DICOM application will propose Presentation Contexts as shown in the following table:

Table 2: *Initiation presentation context - Verification*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCU	None

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3.1.2.1.3 SOP Specific Conformance - Verification SCU

The Application conforms to the definitions of the Verification SCU in accordance to the DICOM Standard.

3.1.3 Association Acceptance Policy

The Verification SCP is part of the Storage SCP - see section 5.1.3 on page 32

4 Implementation Model Storage

The Siemens Med-WS DICOM Application Entity both originates associations for Storage of DICOM Composite Information Objects in Remote Application Entities and receives association requests for Storage from Remote Application Entities.

4.1 Application Data Flow Diagram

The Med-WS DICOM network implementation is a Windows NT application and acts as SCU and SCP for the C-STORE DICOM network service and as SCP for the C-ECHO DICOM network service.

Figure 2: *Application Data Flow Diagram - Storage SCU*

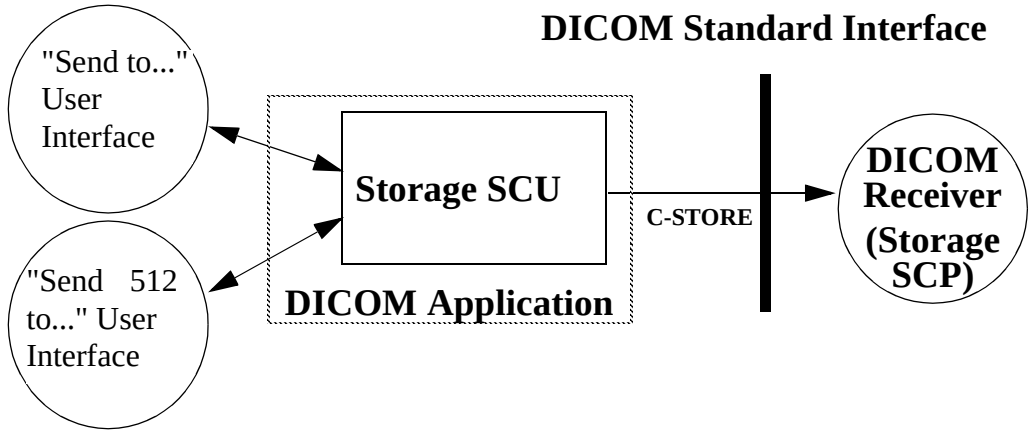
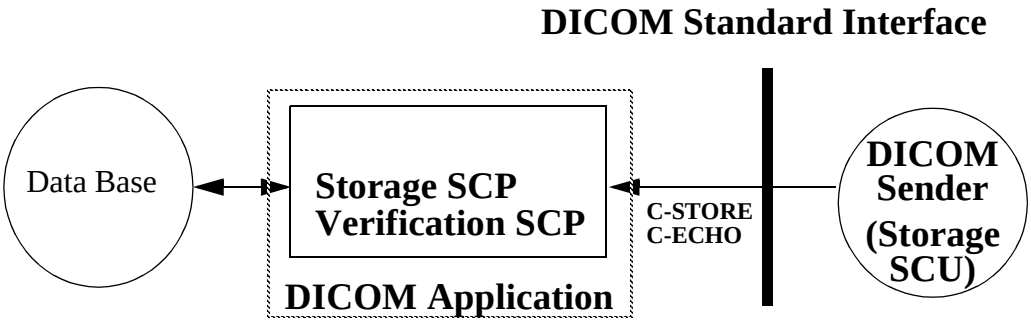


Figure 3: *Application Data Flow Diagram - Storage SCP*



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4.2 Functional Definitions of Application Entities

The Storage SCU is invoked by the job control interface that is responsible for processing network archival tasks. The job consist of data describing the composite image objects selected for storage and the destination. An association is negotiated with the destination application entity and the image data is transferred using the C-STORE DIMSE-Service. Status of the transfer is reported to the job control interface. Sending can also be activated by the "Send 512 to..." interface of the Angio Viewer.

The Storage SCP component of the Siemens Med-WS DICOM application is operating as background server process. It is existing when the machine is powered on and waits for Storage association requests. Upon accepting an association with a negotiated Presentation Context it starts to receive the Composite Image Objects and imports them to local database. Verification requests will be processed and responded by Storage SCP component too.

4.3 Sequencing of real World Activities

not applicable.

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5 Application Entity Specification Storage

5.1 Storage AEs Specification

The Med-WS Storage service class user/service class provider applications use one AE when initiating/receiving associations to/from remote DICOM nodes.

SIEMENS Med-WS DICOM products provide Standard Conformance to the following DICOM V3.0 SOP Classes as an SCU:

Table 3: *SOP Classes as Storage SCU*

SOP Class Name	SOP Class UID
CR Computed Radiography Object Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Information Object Storage	1.2.840.10008.5.1.4.1.1.2
DX Digital X-Ray Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
DX Digital X-Ray Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
MR Image Information Object Storage	1.2.840.10008.5.1.4.1.1.4
NM (Nuclear Medicine) Image Information Object Storage	1.2.840.10008.5.1.4.1.1.20
SC (Secondary Capture) Image Information Object Storage	1.2.840.10008.5.1.4.1.1.7
US Multi-frame Image Information Object Storage	1.2.840.10008.5.1.4.1.1.3.1
US Image Information Object Storage	1.2.840.10008.5.1.4.1.1.6.1
X-Ray Angiographic Image Information Object Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Information Object Storage	1.2.840.10008.5.1.4.1.1.12.2

SIEMENS Med-WS DICOM products provide Private Conformance to the following DICOM V3.0 conform private SOP Classes as an SCU:

Table 4: *Private SOP Classes as Storage SCU*

SOP Class Name	SOP Class UID
CSA Non-Image	1.3.12.2.1107.5.9.1

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SIEMENS Med-WS DICOM products provide Standard Conformance to the following DICOM V3.0 SOP Classes as SCP:

Table 5: *SOP Classes as Storage SCP*

SOP Class Name	SOP Class UID
CR Computed Radiography Object Storage	1.2.840.10008.5.1.4.1.1.1
CT Image Information Object Storage	1.2.840.10008.5.1.4.1.1.2
DX Digital X-Ray Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1
DX Digital X-Ray Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.1
MR Image Information Object Storage	1.2.840.10008.5.1.4.1.1.4
NM (Nuclear Medicine) Image Information Object Storage	1.2.840.10008.5.1.4.1.1.20
SC (Secondary Capture) Image Information Object Storage	1.2.840.10008.5.1.4.1.1.7
US Multi-frame Image Information Object Storage	1.2.840.10008.5.1.4.1.1.3.1
US Image Information Object Storage	1.2.840.10008.5.1.4.1.1.6.1
X-Ray Angiographic Image Information Object Storage	1.2.840.10008.5.1.4.1.1.12.1
X-Ray Radiofluoroscopic Image Information Object Storage	1.2.840.10008.5.1.4.1.1.12.2
Verification	1.2.840.10008.1.1

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SIEMENS Med-WS DICOM products provide Private Conformance to the following DICOM V3.0 conform private SOP Classes as an SCP:

Table 6: *Private SOP Classes as Storage SCP*

SOP Class Name	SOP Class UID
CSA Non-Image	1.3.12.2.1107.5.9.1

5.1.1 Association Establishment Policies

5.1.1.1 General

The existence of a job queue entry with network destination or an internal trigger from processing a retrieve request will activate the DICOM Storage Application. An association request is sent to the destination AE and upon successful negotiation of a Presentation Context the transfer is started.

The default PDU size used will be 32 KB.

5.1.1.2 Number of Associations

The Siemens Med-WS DICOM application initiates several associations at a time, one for each destination to which a transfer request is being processed in the active job queue list.

5.1.1.3 Asynchronous Nature

The Siemens Med-WS DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

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5.1.1.4 Implementation Identifying Information

The Siemens <product> DICOM software provides a single Implementation Class UID of

- 1.3.12.2.1107.5.99.2

and an Implementation Version Name of

- "SIEMENS_LEOVB30B"

The <SW-Version> string is defined by the installed SW.

5.1.2 Association Initiation Policy

If a job with network destination gets active in the job list or a retrieve sub-operation is processed, the Siemens Med-WS DICOM application attempts to initiate a new association for

- DIMSE C-STORE

service operations.

5.1.2.1 Associated Real-World Activity

5.1.2.1.1 Associated Real-World Activity -Send Image Objects to a Network destination

The associated Real-World activity is a C-STORE request initiated by an internal daemon process triggered by a job with network destination or the processing of an external C-MOVE retrieve request. If the process successfully establishes an association to a remote Application Entity, it will transfer each image one after another via the open association. If the C-STORE Response from the remote Application contains a status other than "Success" or "Warning" the association is aborted.

5.1.2.1.2 Proposed Presentation Contexts - Send Images

The Siemens Med-WS DICOM application will propose Presentation Contexts as shown in the following table:

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Table 7: *Initiation presentation context - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
CR Image Storage	1.2.840.10008.5.1.4.1.1.1	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

Table 7: *Initiation presentation context - Storage*

DX Image Storage	1.2.840.10008.5.1.4.1.1.1.1 1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossy Extended *1 (Process 2 & 4) JPEGLossless Process 14 (selection value 1) JPEG Lossy Baseline *1 (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
US Multi-frame Image Storage	1.2.840.10008.5.1.4.1.3.1	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Lossy Extended ***1** (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline ***1** (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCU	None

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Table 7: *Initiation presentation context - Storage*

CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCU	None
		Explicit VR Big Endian	1.2.840.10008.1.2.2		
		Explicit VR Little Endian	1.2.840.10008.1.2.1		

***1** The Transfer Syntax used is strongly influenced by the fact of "how was the accepted Transfer Syntax at the time when the Instance was received". e.g. the Instances received with JPEG Lossy Transfer Syntaxes will not be converted and can only be sent out with the same Transfer Syntax.

The “MOVE destinations” must be configured as Storage destinations. This would include the configuration of Transfer Syntax capabilities.

5.1.2.1.3 SOP Specific Conformance to Storage SOP classes

The Med-WS DR Composing applications will create SC IOD type images when performing special applications that create Derived Images. The SC IOD will be a Standard Extended SC Storage SOP Class. The Angio Viewer will only display XA/XRF images and has functions to create derived XA/XRF images (Store Monitor images). The IIDC application will create derived SC- or XA-Images, depending on related type of input. The 3DAngio application will primarily create CT axial slice images and additional XA corrected images as intermediate results. The 3D viewing application is able to create further 2D (SC) images to document results from 3D processing.

The Med-WS (DICOM) application will not change private attributes as long as no modification is done. During a "Save as..." operation all private attributes not defined within the Med-WS DICOM application will be removed when the new object instance is created.

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5.1.2.1.3.1 Optional Attributes

Data Dictionary of DICOM Type 2 and 3 IOD Attributes

Please see the related Imasge Object definition tables in the Annex for a list of all DICOM IOD attributes of type 2 and 3 which are encoded in the Med-WS applications.

5.1.2.1.3.2 Specialized Information Object Definitions

The DICOM images created by Siemens Med-WS DICOM application conform to the DICOM IOD definitions (Standard extended IODs). But they will contain additional private elements which have to be discarded by a DICOM system when modifying the image.

The DICOM nodes are responsible for data consistency when modifying images. All unknown private attributes have to be removed upon modification!

Data Dictionary of applied private IOD Attributes

Please see "A.2 Siemens Standard Extended Modules" in the Annex for a list of possible private IOD attributes.

5.1.2.1.3.3 Image Pixel Attribute Description for Grayscale Images

The Siemens Med-WS DICOM application supports the Monochrome2 Photometric Interpretation with the unsigned integer 16 bit gray scale pixel and graphic overlay format. The lower 12 bits are used for pixel and the higher 4 bits are used for the graphic overlay:

Pixel plane

+ samples per pixel (attribute 0028, 0002) = 1
+ photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
+ photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
+ pixel representation (attribute 0028, 0103) = 0
+ bits allocated (attribute 0028, 0100) = 8, 16
+ bits stored (attribute 0028,0101) = 8, 10, 12
+ high bit (attribute 0028,0102) = 7, 9, 11

Overlay plane

+ overlay type (attribute 60xx, 0040) = "G"
+ bits allocated (attribute 60xx, 0100) = 16
+ bit position (attribute 60xx, 0102) = 12, 13, 14, 15

Overlay plane

+ overlay type (attribute 60xx, 0040) = "G"
+ bits allocated (attribute 60xx, 0100) = 1
+ bit position (attribute 60xx, 0102) = 0
+ overlay data (attribute 60xx, 3000) = supported.

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5.1.2.1.3.4 Image Pixel Attribute Description for Color Images

The Siemens Med-WS DICOM application supports the RGB color image description with the unsigned integer 24 bit color image plane pixel format (not with Angio Viewer):

+ samples per pixel (attribute 0028, 0002) = 3
+ photometric interpretation (attribute 0028,0004) = "RGB"
+ pixel representation (attribute 0028, 0103) = 0
+ bits allocated (attribute 0028, 0100) = 8
+ bits stored (attribute 0028,0101) = 8
+ high bit (attribute 0028,0102) = 7
+ planar configuration (attribute 0028,0006) = 0.

5.1.2.1.4 Associated Real-World Activity -Send Image Objects 512 to a Network destination

From the Angio Viewing application it is possible to issue special send requests for the job queue. The images in this case are "pre-processed" to be compliant to the Basic Cardiac Image definitions (512^2 Matrix with 8-Bits allocated). Consecutive to the pre-processing stage the transfer is processed as with the normal "Send to..." RWA.

5.1.2.1.5 Proposed Presentation Contexts - "Send 512 to..."

The proposed Presentation Contexts for this RWA are identical to those described in section 5.1.2.1.2.

5.1.2.1.6 SOP Specific Conformance - "Send 512 to..."

The "Send 512 to..." will allow conversion of any image that is displayed in the Angio Viewing application to an image that conforms to the Basic Cardiac format. Conversion is limited to reduction of Matrix Size and Pixel Depth and is restricted to be applied to "image-type" instances only. The converted image is a temporary copy and therefore a new Instance UID is generated according to a reproducible algorithm.

The conversion will generate a Pixel Matrix output that is described by the following Attribute values:

- [0029,0010] Rows = **512**
- [0028,0011] Columns = **512**
- [0028,0100] Bits allocated = **8**
- [0028,0101] Bits Stored = **8**
- [0028,0102] High Bit = **7**

In order to preserve integrity of the data with respect to the original Matrix Size and Pixel Depth, the following attributes will be adapted accordingly for the resulting image:

- [0018,1602] Shutter Left Vertical Edge
- [0018,1604] Shutter Right Vertical Edge
- [0018,1606] Shutter Upper Horizontal Edge
- [0018,1608] Shutter Lower Horizontal Edge
- [0018,1610] Center of Circular Shutter
- [0018,1612] Radius of Circular Shutter.
- [0018,1702] Collimator Left Vertical Edge
- [0018,1704] Collimator Right Vertical Edge
- [0018,1706] Collimator Upper Horizontal Edge
- [0018,1708] Collimator Lower Horizontal Edge
- [0018,1710] Center of Circular Collimator

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- [0018,1712] Radius of Circular Collimator
- [0018,1720] Vertices of the Polygonal Collimator
- [0018,1164] Imager Pixel Spacing
- [0028,1050] Window Center
- [0028,1051] Window Width
- [0028,3002] MOD LUT Descriptor
- [0028,3006] MOD LUT Data
- [6000,0010] Overlay Rows
- [6000,0011] Overlay Columns
- [6000,3000] Overlay Data

5.1.3 Association Acceptance Policy

The Siemens Med-WS DICOM application attempts to accept a new association for

- DIMSE C-ECHO
- DIMSE C-STORE

service operations. Any Information Objects transmitted on that association will be checked on conformance and stored in database if check was successful.

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5.1.3.1 Associated Real-World Activity - Receive

5.1.3.1.1 Associated Real-World Activity - Receiving Image Objects from a Remote Node

The daemon receiving process will accept an association and will receive any images transmitted on that association and will store the images on disk in the own data base if the conformance check is performed successfully.

5.1.3.1.2 Presentation Context Table

The Siemens Med-WS DICOM application will accept Presentation Contexts as shown in the following table:

Table 8: *Acceptable presentation contexts - Storage*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation

Table 8: *Acceptable presentation contexts - Storage*

CR Image Storage	1.2.840.10008.5.1.4.1.1.1	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
MR Image Storage	1.2.840.10008.5.1.4.1.1.4	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
CT Image Storage	1.2.840.10008.5.1.4.1.1.2	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
DX Image Storage	1.2.840.10008.5.1.4.1.1.1.1.1 1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossy Extended (Process 2 & 4) JPEGLossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression RLE Lossless Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.5 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
NM Image Storage	1.2.840.10008.5.1.4.1.1.20	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
US Multi-frame Image Storage	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None

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Table 8: *Acceptable presentation contexts - Storage*

US Image Storage	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
X-Ray Angiographic Image Storage	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
X-Ray Radiofluoroscopic Image Storage	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
SC Image Storage	1.2.840.10008.5.1.4.1.1.7	JPEG Lossy Extended (Process 2 & 4) JPEG Lossless Process 14 (selection value 1) JPEG Lossy Baseline (Process 1) compression Explicit VR Little Endian Explicit VR Big Endian Implicit VR Little Endian	1.2.840.10008.1.2.4.51 1.2.840.10008.1.2.4.70 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2 1.2.840.10008.1.2	SCP	None
CSA Non-Image Storage	1.3.12.2.1107.5.9.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None
Verification	1.2.840.10008.1.1	Implicit VR Little Endian Explicit VR Big Endian Explicit VR Little Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.2 1.2.840.10008.1.2.1	SCP	None

Note

JPEG compression Transfer Syntaxes are supported only for monochrome images (Photometric Interpretation = "MONOCHROME1" or "MONOCHROME2")

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5.1.3.1.3 SOP Specific Conformance Statement - Receiving Images

The Siemens Med-WS DICOM application conforms to the Full Storage Class at Level **2**. In the event of a successful C-STORE operation, the image has successful been written on disk in the Siemens Med-WS (*syngo*) image format.

The Med-WS DICOM receiver returns the status Success upon successful operation otherwise one of the following status codes is returned and the association aborted:

- Refused (A700):
  This error status indicates a lack of Resources (e.g. not enough disk space) on the Med-WS modality.
- Error (A900 or C000):
  An error occurred while processing the image which makes it impossible to proceed. The image will not be stored and the association aborted.

If an image instance is received that is identified by an SOP Instance UID that is already used by an Instance stored in database then the actual received image will be discarded. The existing Instance is not superseded.

The following sections will differentiate the attribute contents required for Image Viewing. The Siemens Med-WS DICOM application supports more formats for Storage of images.

The Angio Viewer will currently only support XA-Images for display.

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5.1.3.1.3.1 Image Pixel Attribute Acceptance Criterion for Grayscale Images

The Med-WS Multi-Modality Viewing application accepts the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format and graphic overlay with unsigned integer and 8 or 16 bits allocated. Accepted values:

Pixel plane

- samples per pixel (attribute 0028, 0002) = 1
- photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
- photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
- pixel representation (attribute 0028, 0103) = 0
- bits allocated (attribute 0028, 0100) = 8, 16
- bits stored (attribute 0028,0101) = 8, 10, 12
- high bit (attribute 0028,0102) = 7, 9, 11

Overlay plane

+ overlay type (attribute 60xx, 0040) = "G"
+ bits allocated (attribute 60xx, 0100) = 16
+ bit position (attribute 60xx, 0102) = 12, 13, 14, 15

Graphic Overlay will be shifted to fill Overlay Planes from Bit 12 and consecutive.

Overlay plane

+ overlay type (attribute 60xx, 0040) = "G"
+ bits allocated (attribute 60xx, 0100) = 1
+ bit position (attribute 60xx, 0102) = 0
+ overlay data (attribute 60xx, 3000) = supported

The Siemens Med-WS Image Viewing application accepts also the MONOCHROME1 and MONOCHROME2 photometric interpretation pixel format with binary 2's complement integer and 16 bits allocated. This format is not supported for Angio Viewer display. Accepted values:

Pixel plane

- samples per pixel (attribute 0028, 0002) = 1
- photometric interpretation (attribute 0028,0004) = "MONOCHROME1"
- photometric interpretation (attribute 0028,0004) = "MONOCHROME2"
- pixel representation (attribute 0028, 0103) = 1
- bits allocated (attribute 0028, 0100) = 16
- bits stored (attribute 0028,0101) = 16
- high bit (attribute 0028,0102) = 15

Overlay plane

+ overlay type (attribute 60xx, 0040) = "G"
+ bits allocated (attribute 60xx, 0100) = 1
+ bit position (attribute 60xx, 0102) = 0
+ overlay data (attribute 60xx, 3000) = supported

For MOD LUT, both the linear LUT (Rescale Slope/Intercept) and the MOD LUT SQ are supported and considered when pixel data is displayed. However there are two limitations. The MOD LUT SQ will be ignored in the following cases:

- signed pixels
- the pixel format is changed by the MOD LUT (e.g. 8bit -> 16bit)

If the MOD LUT SQ contains multiple LUTs, then only the first one is used.

For VOI LUT, both the linear LUT (Window Center/Width) and the VOI LUT SQ are supported (VOI LUT SQ with 8 or 16 bit LUT data)

But if both, a VOI LUT SQ and a linear MOD LUT, are specified within one image, then the value for Rescale Slope is restricted to 1.

If the VOI LUT SQ contains multiple LUTs, then only the first one is used.

Only Rectangular and Circular Shutter Shape is supported in this version. Image with other Shutter Shapes will be displayed w/o shutter.

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5.1.3.1.3.2 Image Pixel Attribute Acceptance Criterion for Color Images

The Siemens Med-WS Multi-Modality Viewing application supports the RGB color image description with the unsigned integer 24 bit color image plane pixel format. This format is not supported for Angio Viewer or DR Composing display. Accepted values:

+ samples per pixel (attribute 0028, 0002) = 3
+ photometric interpretation (attribute 0028,0004) = "RGB"
+ pixel representation (attribute 0028, 0103) = 0
+ bits allocated (attribute 0028, 0100) = 8
+ bits stored (attribute 0028,0101) = 8
+ high bit (attribute 0028,0102) = 7
+ planar configuration (attribute 0028,0006) = 0 (pixel interleave).

The Siemens Med-WS Multi-Modality Viewing application supports the "Palette Color" image description with the unsigned integer and 2's complement pixel format. This format is not supported for Angio Viewer or DR Composing display.

+ samples per pixel (attribute 0028, 0002) = 1
+ photometric interpretation (attribute 0028,0004) = "PALETTE COLOR"
+ pixel representation (attribute 0028, 0103) = 0
+ bits allocated (attribute 0028, 0100) = 8,16
+ bits stored (attribute 0028,0101) = 8,16
+ high bit (attribute 0028,0102) = 7,15

Both 8-Bit and 16-Bit palettes are supported, but NO Segmented Palette Color LUTs.

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5.1.3.1.4 Presentation Context Acceptance Criterion

The Siemens Med-WS DICOM application will accept any number of verification or storage SOP classes that are listed above. There is no limit on the number of presentation contexts accepted, except for the DICOM limit. In the event that the Siemens Med-WS DICOM application runs out of resources, it will reject the association request.

5.1.3.1.5 Transfer Syntax Selection Policies

The Siemens Med-WS DICOM application currently supports

- the Implicit VR Little Endian, the Explicit VR Little Endian and Explicit VR Big Endian Transfer Syntaxes
- the JPEG Lossless Non-hierarchical Transfer Syntax
- the JPEG Baseline and JPEG Extended Transfer Syntaxes (JPEG Lossy).

Any proposed presentation context which includes one of these transfer syntaxes will be accepted. Any proposed presentation context that does not include one of these transfer syntaxes will be rejected.

The order of preference in accepting Transfer Syntaxes within Presentation Contexts or Presentation Contexts with single Transfer Syntaxes is:

1. JPEG Lossy Extended
2. JPEG Lossless non-hierarchival
3. JPEG Lossy Baseline
4. Explicit VR Little Endian
5. Explicit VR Big Endian
6. Implicit VR Little Endian

With Implicit VR Little Endian Transfer Syntax the Med-WS DICOM application will remove any Private Attributes not known to the application. Decision on removal of a Private Element is done if there is NO entry in the dictionary of attributes of the Med-WS DICOM application.

Therefore any Explicit VR Transfer Syntax shall preferably be used by the Storage SCU's when sending Composite Image Instances to the Med-WS DICOM application.

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6 Implementation Model Storage Commit

The Storage Commitment service class defines an application-level class of service which facilitates the commitment to storage. It performs an additional task of commitment of composite objects apart from the network based storage of images as defined by the Storage Service class. The AX-WS DICOM implementation supports the Storage Commitment Push Model as SCU and SCP.

6.1 Application Data Flow Diagram

The AX-WS DICOM network implementation is a Windows NT application and acts as SCU/ SCP for the Storage Commitment Push Model Service using the Storage Commitment Service Class.

Figure 4: *Application Data Flow Diagram Storage Commitment SCU*

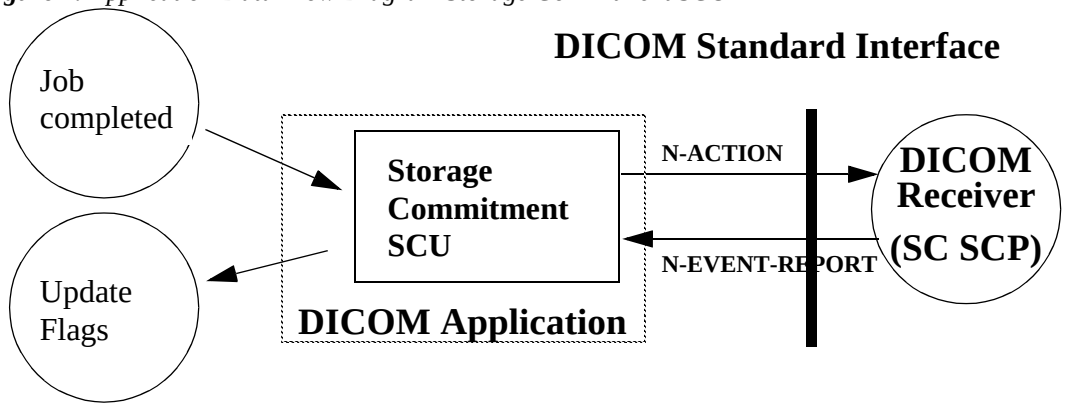

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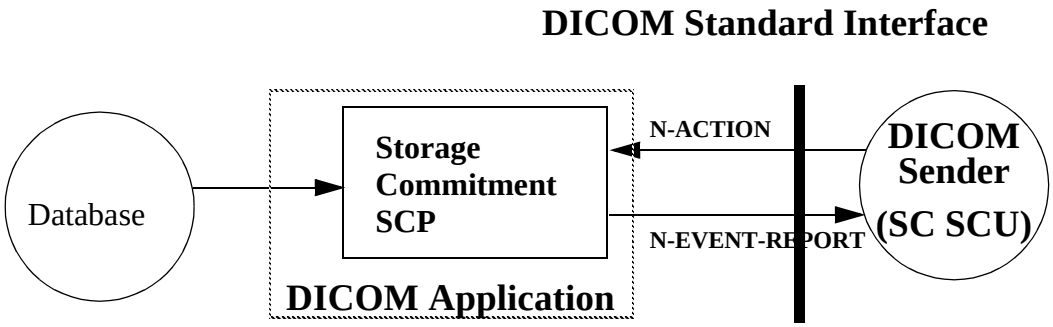
Figure 5: *Application Data Flow Diagram Storage Commitment SCP*



6.2 Functional Definitions of Application Entities

With each successfully completed send job, the AX-WS DICOM Application will create a Storage Commitment Push Model Identifier from the SOP Instances sent. Then a Storage Commit Request is triggered. Depending on configuration, the AX-WS DICOM application will keep

the association open for responses with a configurable time-out, or closes the association and expects responses on a different association that has to be established by the remote Storage Commitment SCP.

The commitment status derived from the related trigger response will be indicated in the related Status Flags of the related entity. It is possible to create triggers ("auto rules") from this event.

Note

Only images saved in database can be tagged with Status Flags. Therefore any temporary images sent, will not have any indication about successful commitment.

The Transaction UIDs of the pending commitment request are kept "open" for a configurable amount in time (default: 1h). If the "open time" for a pending commitment request has elapsed w/o a related response from the provider, the Transaction UID is removed and the related entities are indicated as "commit failed".

In any case, commitment will only be requested for previously and successfully sent images.

The Storage Commitment SCP is running in background and is ready to receive request when the system is started.

6.3 Sequencing of real World Activities

The Storage Commitment trigger is automatically derived from the successful completion of a Send Job.

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7 AE Specification Storage Commitment

7.1 Storage CommitmentAE Specification

SIEMENS AX-WS DICOM application provides Standard Conformance to the following DICOM V3.0 SOP Class as an SCU and SCP:

Table 9: *Storage Commitment SOP Class as an SCU and SCP*

SOP Class Name	SOP Class UID
Storage Commitment Push Model	1.2.840.10008.1.20.1

7.1.1 Association Establishment Policies

7.1.1.1 General

With a Send Job successfully completed, the DICOM application will generate an Storage Commitment Identifier which references to all Instances of the processed job. The Commit Request is then sent over a single opened association. The AX-WS will wait for Status responses of the Storage Commitment Request. If the Provider accepts the Storage Commitment with Success Status, the generated Transaction UID, together with study identification data and a time-stamp, is kept. Depending on configuration, the association is closed when the configured time-out has elapsed or a response was received before. If the association is closed before a response was received, the response is then expected on a different association. Multiple Storage Commitment Requests can be pending.

The default PDU size used will be 32 KB.

7.1.1.2 Number of Associations

The Siemens AX-WS DICOM application initiates several associations at a time, one for each storage commitment request being processed.

7.1.1.3 Asynchronous Nature

The Siemens AX-WS DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

7.1.1.4 Implementation Identifying Information

The Siemens AX-WS DICOM software provides a single Implementation Class UID of

- 1.3.12.2.1107.5.4.7

and an Implementation Version Name of

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- "LEONARDO_V<SW-Version (e.g. A40A)>"

The <SW-Version> string is defined by the installed SW.

7.1.2 Association Initiation Policy

The AX-WS DICOM Application Entity acts as a Service Class User (SCU) for the

- Storage Commitment Push Model Service Class (to request commitment for storage of instances previously sent).

To do so, the AX-WS will issue a

- N-ACTION DIMSE to request commitment or a
- N-EVENT-REPORT DIMSE to respond to a received storage commitment request and the association was closed by the remote system prior to response.

7.1.2.1 Real World Activity

7.1.2.1.1 Associated Real-World Activity - Job Completed

The AX-WS Storage Commitment application sends the commit request (N-ACTION-RQ) message and waits for acceptance of this request (N-ACTION-RSP). After receiving this, the transaction is marked as “waiting”.

Depending on a configuration value, the association will then be closed or kept open. In the first case, there is another configurable value giving the number of hours/minutes (by default 1h0m) to wait for the corresponding commit response (N_EVENT_REPORT). In the second case, this time is the (also configurable) time-out for the association. For both cases, if the commit response (N_EVENT_REPORT) does not arrive during the configured time, the transaction will be marked as failed.

If the commit response (N_EVENT_REPORT) received has the status of "complete - failure exists", the transaction is marked as failed, else the transaction is marked as "completed"; In both cases, a message is shown to the user.

7.1.2.1.2 Proposed Presentation Contexts - Job Completed

The Siemens AX-WS DICOM application will propose Presentation Contexts as shown in the following table:

Table 10: *Proposed presentation contexts - request Storage commitment*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation

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Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

7.1.2.1.3 SOP Specific Conformance Statement- Job Completed

Storage Commitment is supported for all the SOP class UIDs as mentioned in 'Acceptable presentation contexts - Storage' in the Storage SCP section of this document.

The Referenced Study Component Sequence is not supported.

Storage Media File-Set ID and UID Attributes will not be supported in the commitment request (N-ACTION primitive) invoked by the Storage Commitment SCU.

7.1.2.1.4 Associated Real-World Activity - Send Commit Response

Acting as an Storage Commitment Provider, the AX-WS Storage Commitment AE received an Storage Commitment request, carried out the request, and is ready to send back the response, but the association is not open anymore. In this case it will by itself initiate an association to send the storage commitment response (N_EVENT_REPORT) to the SCU.

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7.1.2.1.5 Proposed Presentation Contexts - Send Commitment Response

The Siemens AX-WS DICOM application will propose Presentation Contexts as shown in the following table:

Table 11: *Proposed presentation contexts - send Storage commitment response*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

7.1.2.1.6 SOP Specific Conformance Statement - Send Commitment Response

Storage Media File-Set ID and UID Attributes will not be supported in the N-EVENT-REPORT primitive invoked by the Storage Commitment SCP.

7.1.3 Association Acceptance Policy

The AX-WS DICOM Application Entity acts as a Service Class Provider (SCP) for the

- Storage Commitment Push Model Service Class (to proof commitment for storage of instances previously received).

To do so, the AX-WS attempts to accept a

- N-ACTION DIMSE to receive a commitment request for the instance included or a
- N-EVENT-REPORT DIMSE to receive a storage commitment response from a previous request and the SCP behavior requires a different association than the commit request.

7.1.3.1 Associated Real-World Activity - Commit SCP

7.1.3.1.1 Associated Real-World Activity - Receive Commit Request

When receiving an Storage Commitment request the AX-WS DICOM application will perform the necessary steps to check the received list of Instances against the local database.

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7.1.3.1.2 Accepted Presentation Contexts - Receive Commit Request

The Siemens AX-WS DICOM application will accept Presentation Contexts as shown in the following table:

Table 12: *Accepted presentation contexts - Receive Storage commitment request*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian	1.2.840.10008.1.2	SCP	None
		Explicit VR Little Endian	1.2.840.10008.1.2.1		
		Explicit VR Big Endian	1.2.840.10008.1.2.2		

7.1.3.1.3 SOP-specific Conformance Statement - Receive Commit Request

The AX-WS Storage Commitment AE will return success for images that are stored in the local database and failure for images that are not.

Note

Only one N-ACTION-RQ per association is currently supported by the Storage Commitment SCP.

Storage Media File-Set ID and UID Attributes will not be supported in the N-EVENT-REPORT primitive invoked by the Storage Commitment SCP.

7.1.3.2 Associated Real-World Activity - Commit SCU

7.1.3.2.1 Associated Real-World Activity - Update Flags

The AX-WS Storage Commitment DICOM Application has sent a Storage Commitment Request and, being configured to receive response on a separate association, has closed the association, and now it gets an association request from the Storage Commitment SCP that want to send the results. Consecutive to start-up, the AX-WS DICOM application will await Storage commitment Notification triggers. Any incoming Notification will be checked for validity, that is, if the related Transaction UID is still part of the Pending Request Queue.

If the Notification is valid, the Notification Identifier is evaluated and the related Instances marked with the related status. The over-all Commit Status of the higher Information Entities is derived from propagation of the States of all Image entities included in a study.

The Status Flags directly affected by Storage Commitment results and indicated in the different entities of the Patient Browser list can be one of

- "AC" or "SC" - Successful Commitment, A means archived to configured Archive destination, whereas S means sent to any other destination
- "Af" of "Sf" - Commitment failed.
- "A?" or "S?" - Commitment request is sent, response is pending.

In case of failure the user has to repeat the transfer of images to the Archive destination. Another Storage Commitment will be performed after sending is completed successfully.

Note

Setting of Status Flags is only possible for previously stored images. Any temporary image sent, will not be affected by a Commit Response, due to the fact that there is no permanent data-set to be updated.

7.1.3.2.2 Accepted Presentation Contexts - Update Flags

The Siemens AX-WS DICOM application will accept Presentation Contexts as shown in the following table:

Table 13: *Accepted presentation contexts - Update Flags (receive commit response)*

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Storage Commitment Push Model	1.2.840.10008.1.20.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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7.1.3.2.3 SOP-specific Conformance Statement - Update Flags

If the Commitment response (N_EVENT_REPORT) received has the status of "complete - failure exists", the transaction is marked as failed, else the transaction is marked as "completed"; In both cases, a message is shown to the user.

The related status flags are set for the committed images in the local database.

The AX-WS DICOM application will NOT support the Storage Media File Set ID attributes.

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8 Implementation Model Query/Retrieve

The query/retrieve service class defines an application-level class of services which facilitates the management of images and patient data against the well defined information model of DICOM and allows a DICOM AE to retrieve images from a remote DICOM node or to request a remote DICOM AE to initiate a transfer of images to another DICOM AE. The Med-WS DICOM query/retrieve application supports the query/retrieve services to act as SCU and SCP.

8.1 Application Data Flow Diagram

The Med-WS DICOM network implementation is a Windows NT application and acts as SCU and SCP for the query/retrieve network service.

Figure 6: *Application Data Flow Diagram - Query/Retrieve SCU*

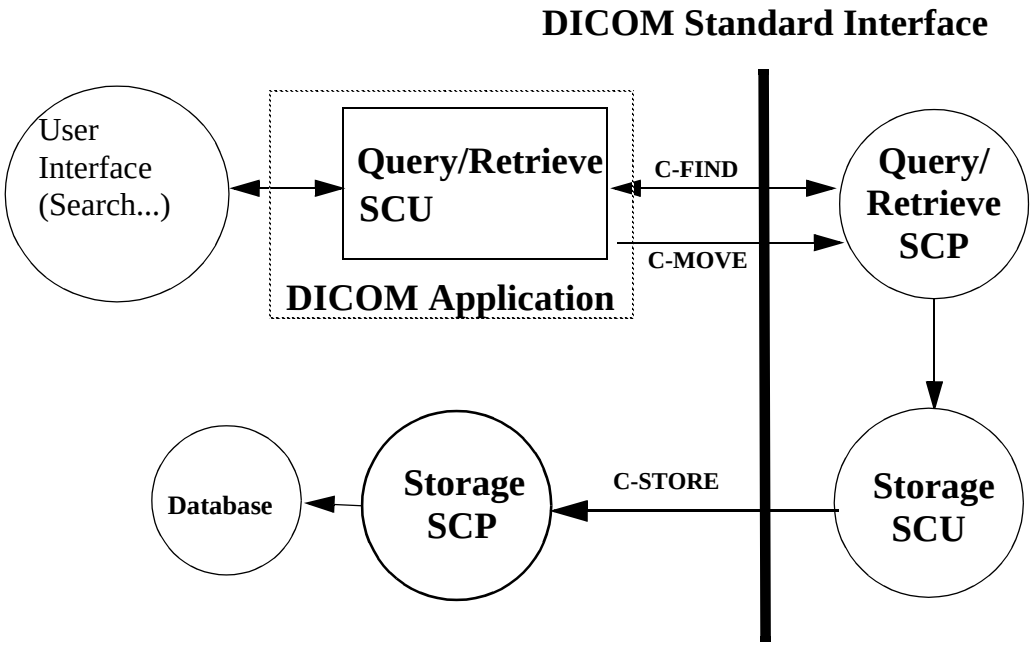

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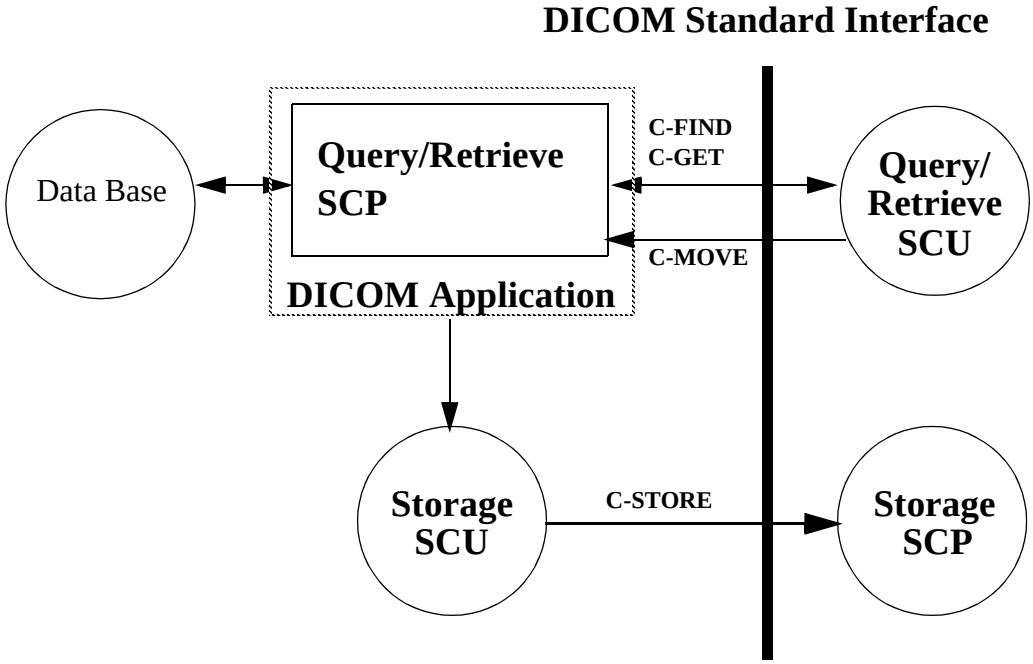
Figure 7: *Application Data Flow Diagram - Query/Retrieve SCP*



8.2 Functional Definitions of Application Entities

The Med-WS DICOM query/retrieve SCU requests the remote query/retrieve SCP to perform a search and match to the keys specified in the request in order to display the results in the Med-WS user interface. Depending on user action (Import) the Med-WS DICOM SCU sends a C-MOVE DIMSE service to initiate a C-STORE sub-operation on the SCP to start an image transfer from remote Storage SCU (running on Query/Retrieve SCP) to the Med-WS Storage SCP.

The Med-WS DICOM query/retrieve SCP responds to C-FIND DIMSE services from remote SCU and depending on further remote request a C-GET or a C-MOVE involves the Siemens Med-WS DICOM query/retrieve SCP application to initiate a C-STORE sub-operation (by triggering and parametrizing the own Storage SCU) to send image objects to a remote Storage SCP.

All components of the Siemens DICOM query/retrieve SCP application are operating as background server processes. They are existing when the machine is powered on and then respond to queries based on the records stored in its database.

8.3 Sequencing of real World Activities

Retrieve of images is only possible if results from a previous “Search...” operation exist and those entities can be selected for “Import”.

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9 AE Specification Query/Retrieve

9.1 Query/Retrieve Service AEs Specification

The Query/Retrieve SCU requests that the remote SCP performs a match of all keys specified in the request, against the information in its database and the identified images will be moved over a different (C-MOVE) storage association.

The Query/Retrieve SCP responds to queries based on the records in its database and images will be sent to the requesting SCU or to a different storage destination.

SIEMENS Med-WS DICOM products provide Standard Conformance to the following DICOM V3.0 SOP Classes as SCU:

Table 14: *Query/Retrieve SOP Classes as an SCU*

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2

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SIEMENS Med-WS DICOM products provide Standard Conformance to the following DICOM V3.0 SOP Classes as an SCP:

Table 15: *Query/Retrieve SOP Classes as an SCP*

SOP Class Name	SOP Class UID
Patient Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.1.1
Patient Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.1.2
Patient Root Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.1.3
Study Root Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.2.1
Study Root Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.2.2
Study Root Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.2.3
Patient/Study Only Query/Retrieve Information Model - FIND	1.2.840.10008.5.1.4.1.2.3.1
Patient/Study Only Query/Retrieve Information Model - MOVE	1.2.840.10008.5.1.4.1.2.3.2
Patient/Study Only Query/Retrieve Information Model - GET	1.2.840.10008.5.1.4.1.2.3.3

Note

See also the Storage DICOM Conformance Statement section of the Siemens Med-WS DICOM application to compare for conformance of the C-STORE sub-operation generated by the C-GET or C-MOVE DIMSE services. Furthermore compare the supported Storage Service SOP

classes described in the Storage DICOM Conformance Statement of the Modality to which the images shall be transferred to.

9.1.1 Association Establishment Policies

9.1.1.1 General

With the "Search..." function the query data are input and the DICOM query/retrieve application is started. An query request will be sent out to one remote node that can be selected from a list of configured Query Providers and the response data will be displayed for the user. Upon request (Import), the retrieval of selected items is initiated.

The default PDU size used will be 32 KB.

9.1.1.2 Number of Associations

The Siemens Med-WS DICOM application initiates one association for each query request being processed to a remote node.

9.1.1.3 Asynchronous Nature

The Siemens Med-WS DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

9.1.1.4 Implementation Identifying Information

The Siemens Med-WS DICOM software provides a single Implementation Class UID of

- 1.3.12.2.1107.5.4.7

and an Implementation Version Name of

- "LEONARDO_V<SW-Version (e.g. A40A)>"

The <SW-Version> string is defined by the SW installed.

9.1.2 Association Initiation Policy

The query user interface will request the query-data from user and triggers one C-FIND request to the selected remote node. The response data will be displayed in the query UI for further data navigation.

When requesting Import of related items the browser requests the retrieve application to send a C-MOVE request to the related remote node. Images will then be received by the Storage SCP as described in the related section.

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9.1.2.1 Real World Activity - Find SCU

9.1.2.1.1 Associated Real-World Activity - "Search"

The associated Real-World activity is to fill out a query form with search data and pass it as query to the network application which issues a C-FIND over a previously build association. The remote SCP will respond with related data-entries that will be passed to a browser application. When data transfer is finished the association is closed.

9.1.2.1.2 Proposed Presentation Contexts - "Search"

The Siemens Med-WS DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended Negotiation
Name	UID	Name List	UID List		
Patient Root Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Study Root Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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It is configurable which of the two query models (or both) are to be used by the Med-WS DICOM Query SCU application.

9.1.2.1.3 SOP Specific Conformance Statement - Find SCU

The Siemens Med-WS DICOM Query/Retrieve SCU supports hierarchical queries with all mandatory search keys. The interactive querying of attributes on IMAGE level is not supported by the Query SCU, hence retrieval of individual Objects is possible. The following table describes the search keys for the different query models that the SCU supports. Matching is either wildcard, which means that the user can supply a string containing wildcards, or universal, which means that the attribute is requested as return value.

Table 16: *Patient Root and Study Root query attributes*

Attribute name	Tag	Type	Matching	User input	return value display
Patient Level[a]					
Patient Name	(0010,0010)	R	Wildcard[b]	enter value	yes
Patient ID	(0010,0020)	U / R	Wildcard[b]	enter value	yes
Patient's Birth date	(0010,0030)	O	universal (Null)	-	yes
Patient's Sex	(0010,0040)	O	universal (Null)	-	yes
Number of Patient related Studies	(0020,1200)	O	universal (Null)	-	yes
Number of Patient related Series	(0020,1202)	O	universal (Null)	-	yes
Number of Patient related Instances	(0020,1204)	)	universal (Null)	-	yes
Study Level					
Patient Name[c]	(0010,0010)	R	Wildcard[b]	enter value	yes
Patient ID	(0010,0020)	U / R	Wildcard[b]	enter value	yes
Study Instance UID	(0020,000D)	U	single value	select from list	yes
Study ID	(0020,0010)	R	universal (Null)	-	yes
Study Date	(0008,0020)	R	universal (Null)	-	yes
Study Time	(0008,0030)	R	universal (Null)	-	yes
Accession Number	(0008,0050)	R	universal (Null)	-	yes
Study Description	(0008,1030)	O	universal (Null)	-	yes
Referring Physician's Name	(0008,0090)	O	universal (Null)	-	yes
Name of Physician Reading Study	(0008,1060)	O	universal (Null)	-	yes
Modalities in Study	(0008,0061)	O	universal (Null)	-	yes
Storage Media File-Set ID	(0008,0130)	O	universal (Null)	-	yes
Retrieve AE Title	(0008,0054)	O	universal (Null)	-	yes
Number of Study related Series	(0020,1206)	O	universal (Null)	-	yes
Number of Study related Instances	(0020,1208)	O	universal (Null)	-	yes
Series Level					
Series Instance UID	(0020,000E)	U	single value	select from list	yes
Series Number	(0020,0011)	R	universal (Null)	-	yes

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Table 16: *Patient Root and Study Root query attributes*

Attribute name	Tag	Type	Matching	User input	return value display
Modality	(0008,0060)	R	universal (Null)	-	yes
Series Date	(0008,0021)	O	universal (Null)	-	yes
Series Time	(0008,0031)	O	universal (Null)	-	yes
Series Description	(0008,103E)	O	universal (Null)	-	yes
Storage Media File-Set ID	(0008,0130)	O	universal (Null)	-	yes
Retrieve AE Title	(0008,0054)	O	universal (Null)	-	yes
Protocol Name	(0018,1030)	O	universal (Null)	-	yes
Perf. Procedure Step Start Date	(0040,0244)	O	universal (Null)	-	yes
Perf. Procedure Step Start Time	(0040,0245)	O	universal (Null)	-	yes
Number of Series related Instances	(0020,1209)	O	universal (Null)	-	yes
Image Level					
SOP Instance UID	(0008,0018)	U	single value	-	yes
Image Number	(0020,0013)	R	universal (Null)	-	yes
Storage Media File-Set ID	(0008,0130)	O	universal (Null)	-	yes
Retrieve AE Title	(0008,0054)	O	universal (Null)	-	yes
Instance Date	(0008,0023)	O	universal (Null)	-	yes
Instance Time	(0008,0033)	O	universal (Null)	-	yes
Number of Frames	(0028,0008)	O	universal (Null)	-	yes
Image Comments	(0020,4000)	O	universal (Null)	-	yes

a. Patient Root Information Model only
b. Always a '*" is appended to the user-supplied string
c. Study Root Information Model only

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The Find SCU interprets following status codes:

Table 17: *C-FIND response status*

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None

Table 17: C-FIND response status

Service Status	Meaning	Protocol Codes	Related Fields
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

9.1.2.2 Real World Activity - Move SCU

9.1.2.2.1 Associated Real-World Activity - Move SCU "Import"

When selecting a data entry in the Query UI and activating the "Import" function, a retrieval request is passed to the archival application which issues a C-MOVE service according to the Patient Root or Study Root query model. (The Storage Service Class Conformance Statement of the SCP will describe the C-STORE service which is generated by the C-MOVE service.)

The transferred image data are processed as described in the storage class SCP descriptions.

The possibility to request the remote C-MOVE provider (remote application that responded to the C-FIND) to move data to an application entity other that the C-MOVE SCU (the Med-WS DICOM application) is NOT USED.

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9.1.2.2.2 Proposed Presentation Contexts - Move SCU

The Siemens Med-WS DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Study Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

Note

C-MOVE extended negotiation will not be supported by the SCU.

9.1.2.2.3 SOP Specific Conformance Statement - Move SCU

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations must be done on a different association to transfer images to the own Storage Service Class SCP.

The Move SCU interprets following status codes:

Table 18: *C-MOVE response status*

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches Out of Resources - Unable to perform sub operations	A701 A702	(0000,0902) (0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
Failed	Unable to process	Cxxx	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures or Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

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9.1.3 Association Acceptance Policy

The Siemens Med-WS DICOM application will accept associations for the following DIMSE-C operations as SCP:

- C-FIND

- C-GET
- C-MOVE
- C-FIND-CANCEL
- C-GET-CANCEL
- C-MOVE-CANCEL

Extended negotiation - which is relational retrieve - is NOT supported for the above listed services. The Med-WS DICOM application does support multiple C-FIND requests over the same association, while multiple C-MOVE or C-GET operations are NOT supported over the same association.

9.1.3.1 Real World Activity - Find SCP

9.1.3.1.1 Associated Real-World Activity - Find request to SCP

The associated Real-World activity is to respond query requests to an SCU with the query model Patient Root, Study Root and Patient/Study Only. Relational retrieve operation is NOT supported. With a C-FIND-CANCEL request the running query can be canceled at any time.

Multiple C-FIND requests over the same association are supported.

9.1.3.1.2 Accepted Presentation Contexts - Find SCP

The Siemens Med-WS DICOM application will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.2.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/Retrieve Find	1.2.840.10008.5.1.4.1.2.3.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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Note

C-FIND extended negotiation will not be supported by the SCP.
The order of preference for accepting Transfer Syntaxes is: 1. Explicit VR Little Endian, 2. Explicit VR Big Endian, 3. Implicit VR Little Endian.

9.1.3.1.3 SOP Specific Conformance Statement - Find SCP

The Siemens Med-WS DICOM Query/Retrieve SCP supports hierarchical queries with all mandatory and optional search keys.

The query attribute contents will be treated case-sensitive.

With wildcard queries the symbol "?" is treated as "*" by the C-FIND SCP application. As a consequence the query string of "?abc*" will be processed as "*abc*".

If the value for the patient-level unique key "Patient ID" is not known, it may be returned with zero length. The attribute “Image Comments” will not be include in the C-FIND-RSP, if it is not set in the DB, even if it was requested as return key in the related C-FIND-RQ.

Usage of Storage Media File-Set ID, Retrieve AE Title with C-FIND-RSP message:

- The Storage Media File-Set ID - if existent - can be returned at Study/Series/Image Level. Only on Image Level, the values of ONLINE, NEARLINE of OFFLINE are returned to indicate the Storage Location of the related Instance.
- The Retrieve AE Title - if existent - can only be returned at Image Level (for Patient Root and Study Root models) or Study Level (for Patient/Study Only model).

Relational Queries are not supported.

A remote DICOM AE can cancel the running query by sending a C-FIND-CANCEL. Matches are possibly continuing (more C-FIND responses with status PENDING) until the cancel operation has completed.

The supported attributes on the various query levels of the three supported information models are list in the tables of the following sections.

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9.1.3.1.3.1 Patient Root Information Model

Table 19: *Patient level attributes, Patient Root Information Model*

Attribute name	Tag	Type	Matching
Patient Name	(0010,0010)	R	single value, wildcard, universal
Patient ID	(0010,0020)	U	single value, wildcard, universal
Patient's Birth Date	(0010,0030)	O	single value, range, universal
Patient's Birth Time	(0010,0032)	O	single value, range, universal
Patient's Sex	(0010,0040)	O	single value, wildcard, universal
Ethnic Group	(0010,2160)	O	single value, wildcard, universal
Patient Comments	(0010,4000)	O	wildcard, universal
Number of Patient related Studies	(0020,1200)	O	universal
Number of Patient related Series	(0020,1202)	O	universal
Number of Patient related Instances	(0020,1204)	O	universal

Table 20: *Study level attributes, Patient Root Information Model*

Attribute name	Tag	Type	Matching
Study Instance UID	(0020,000D)	U	single value, list of UIDs
Study ID	(0020,0010)	R	single value, wildcard, universal
Study Date	(0008,0020)	R	single value, range, universal
Study Time	(0008,0030)	R	single value, range, universal
Accession Number	(0008,0050)	R	single value, wildcard, universal
Referring Physician's Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Admitting Diagnoses Description	(0008,1080)	O	single value, wildcard, universal
Patient's Age	(0010,1010)	O	single value, wildcard, universal
Patient's Size	(0010,1020)	O	single value, universal

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Table 20: *Study level attributes, Patient Root Information Model*

Attribute name	Tag	Type	Matching
Patient's Weight	(0010,1030)	O	single value, universal
Occupation	(0010,2180)	O	single value, wildcard, universal
Additional Patient History	(0010,21B0)	O	wildcard, universal
Name of Physician reading Study	(0008,1060)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	multiple values, universal
Number of Study related Series	(0020,1206)	O	universal
Number of Study related Instances	(0020,1208)	O	universal

Table 21: *Series level attributes, Patient Root Information Model*

Attribute name	Tag	Type	Matching
Series Instance UID	(0020,000E)	U	single value, list of UID
Series Number	(0020,0011)	R	single value, universal
Modality	(0008,0060)	R	single value, wildcard, universal
Laterality	(0020,0060)	O	single value, wildcard, universal
Body Part Examined	(0018,0015)	O	single value, wildcard, universal
Patient Position	(0018,5100)	O	single value, wildcard, universal
Smallest Pixel Value in Series	(0028,0108)	O	single value, universal
Largest Pixel Value in Series	(0028,0109)	O	single value, universal
Protocol Name	(0018,1030)	O	single value, wildcard, universal
Series Date	(0008,0021)	O	single value, range, universal
Series Time	(0008,0031)	O	single value, range, universal
Series Description	(0008,103E)	O	single value, wildcard, universal
Operators Name	(0008,1070)	O	single value, wildcard, universal
Performing Physician's Name	(0008,1050)	O	single value, wildcard, universal
Perf. Procedure Step Start Date	(0040,0244)	O	universal
Perf. Procedure Step Start Time	(0040,0245)	O	universal

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Table 21: *Series level attributes, Patient Root Information Model*

Attribute name	Tag	Type	Matching
Number of Series related Instances	(0020,1209)	O	universal

Table 22: *Image level attributes, Patient Root Information Model*

Attribute name	Tag	Type	Matching
SOP Instance UID	(0008,0018)	U	single value, list of UID
Image Number	(0020,0013)	R	single value, universal
Image Date	(0008,0023)	O	single value, range, universal
Image Time	(0008,0033)	O	single value, range, universal
Modality	(0008,0060)	O	single value, wildcard, universal
Image Comments	(0020,4000)	O	universal

9.1.3.1.3.2 Study Root Information Model

Table 23: *Study level attributes, Study Root Information Model*

Attribute name	Tag	Type	Matching
Patient Name	(0010,0010)	R	single value, wildcard, universal
Patient ID	(0010,0020)	R	single value, wildcard, universal
Patient's Birth Date	(0010,0030)	O	single value, range, universal
Patient's Birth Time	(0010,0032)	O	single value, range, universal
Patient's Sex	(0010,0040)	O	single value, wildcard, universal
Patient Comments	(0010,4000)	O	wildcard, universal
Number of Patient related Studies	(0020,1200)	O	universal
Number of Patient related Series	(0020,1202)	O	universal
Number of Patient related Instances	(0020,1204)	O	universal
Study Instance UID	(0020,000D)	U	single value, list of UIDs
Study ID	(0020,0010)	R	single value, wildcard, universal
Study Date	(0008,0020)	R	single value, range, universal

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Attribute name	Tag	Type	Matching
Study Time	(0008,0030)	R	single value, range, universal
Accession Number	(0008,0050)	R	single value, wildcard, universal
Referring Physician's Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Admitting Diagnoses Description	(0008,1080)	O	single value, wildcard, universal
Patient's Age	(0010,1010)	O	single value, wildcard, universal
Patient's Size	(0010,1020)	O	single value, universal
Patient's Weight	(0010,1030)	O	single value, universal
Occupation	(0010,2180)	O	single value, wildcard, universal
Additional Patient History	(0010,21B0)	O	wildcard, universal
Name of Physician reading Study	(0008,8060)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	multiple values, universal
Number of Study related Series	(0020,1206)	O	universal
Number of Study related Instances	(0020,1208)	O	universal

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Table 24: *Series level attributes, Study Root Information Model*

Attribute name	Tag	Type	Matching
Series Instance UID	(0020,000E)	U	single value, list of UID
Series Number	(0020,0011)	R	single value, universal
Modality	(0008,0060)	R	single value, wildcard, universal
Laterality	(0020,0060)	O	single value, wildcard, universal
Body Part Examined	(0018,0015)	O	single value, wildcard, universal
Patient Position	(0018,5100)	O	single value, wildcard, universal
Smallest Pixel Value in Series	(0028,0108)	O	single value, universal
Largest Pixel Value in Series	(0028,0109)	O	single value, universal

Protocol Name	(0018,1030)	O	single value, wildcard, universal
Series Date	(0008,0021)	O	single value, range, universal
Series Time	(0008,0031)	O	single value, range, universal
Series Description	(0008,103E)	O	single value, wildcard, universal
Operators Name	(0008,1070)	O	single value, wildcard, universal
Performing Physician's Name	(0008,1050)	O	single value, wildcard, universal
Performed Procedure Step Start Date	(0040,0244)	O	universal
Performed Procedure Step Start Time	(0040,0245)	O	universal
Number of Series related Instances	(0020,1209)	O	universal

Table 25: *Image level attributes, Study Root Information Model*

Attribute name	**Tag**	**Type**	**Matching**
SOP Instance UID	(0008,0018)	U	single value,list of UID
Image Number	(0020,0013)	R	single value, universal
Image Date	(0008,0023)	O	single value, range, universal
Image Time	(0008,0033)	O	single value, range, universal
Modality	(0008,0060)	O	single value, wildcard, universal
Image Comments	(0020,4000)	O	universal

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9.1.3.1.3.3 Patient Study Only Information models

Table 26: *Patient instance level, Patient Study Only Information Model*

Attribute name	**Tag**	**Type**	**Matching**
Patient Name	(0010,0010)	R	single value, wildcard, universal
Patient ID	(0010,0020)	U	single value, wildcard, universal
Patient's Birth Date	(0010,0030)	O	single value, range, universal
Patient's Birth Time	(0010,0032)	O	single value, range, universal

Attribute name	Tag	Type	Matching
Patient's Sex	(0010,0040)	O	single value, wildcard, universal
Ethnic Group	(0010,2160)	O	single value, wildcard, universal
Patient Comments	(0010,4000)	O	wildcard, universal
Number of Patient related Studies	(0020,1200)	O	universal
Number of Patient related Series	(0020,1202)	O	universal
Number of Patient related Instances	(0020,1204)	O	universal

Table 27: *Study level attributes, Patient Study Only Information Model*

Attribute name	Tag	Type	Matching
Study Instance UID	(0020,000D)	U	single value,list of UIDs
Study ID	(0020,0010)	R	single value, wildcard, universal
Study Date	(0008,0020)	R	single value, range, universal
Study Time	(0008,0030)	R	single value, range, universal
Accession Number	(0008,0050)	R	single value, wildcard, universal
Referring Physician's Name	(0008,0090)	O	single value, wildcard, universal
Study Description	(0008,1030)	O	single value, wildcard, universal
Admitting Diagnoses Description	(0008,1080)	O	single value, wildcard, universal
Patient's Age	(0010,1010)	O	single value, wildcard, universal
Patient's Size	(0010,1020)	O	single value, universal
Patient's Weight	(0010,1030)	O	single value, universal
Occupation	(0010,2180)	O	single value, wildcard, universal
Additional Patient History	(0010,21B0)	O	wildcard, universal
Name of Physician reading Study	(0008,8060)	O	single value, wildcard, universal
Modalities in Study	(0008,0061)	O	multiple values, universal
Number of Study related Series	(0020,1206)	O	universal
Number of Study related Instances	(0020,1208)	O	universal

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The Find SCP returns following status codes:

Table 28: *C-FIND SCP return status*

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources	A700	(0000,0902)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Matching terminated due to Cancel request	FE00	None
Success	Matching is complete - No final Identifier is supplied	0000	None
Pending	Matches are continuing - Current Match is supplied and any Optional Keys were supported in the same manner as Required Keys	FF00	Identifier
	Matches are continuing - Warning that one or more Optional Keys were not supported for existence and/or matching for this identifier	FF01	Identifier

9.1.3.2 Real World Activity - Get SCP

9.1.3.2.1 Associated Real-World Activity - Get request to SCP

The associated Real-World activity is to respond to retrieve requests initiated from a foreign SCU. The SCP supports the query model Patient Root, Study Root and Patient/Study Only. The Storage Service Class Conformance Statement describes the C-STORE service which is generated by the C-GET service. Relational retrieve operation is NOT supported.

Multiple C-GET requests over the same association are NOT supported.

9.1.3.2.2 Accepted Presentation Contexts - Get SCP

The Siemens Med-WS DICOM application will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/Retrieve Get	1.2.840.10008.5.1.4.1.2.1.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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Study Root Query/Retrieve Get	1.2.840.10008.5.1.4.1.2.2.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/ Retrieve Get	1.2.840.10008.5.1.4.1.2.3.3	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

Note

C-GET extended negotiation will not be supported by the SCP.
The order of preference for accepting Transfer Syntaxes is: 1. Explicit VR Little Endian, 2. Explicit VR Big Endian, 3. Implicit VR Little Endian.

9.1.3.2.3 SOP Specific Conformance Statement - Get SCP

At association establishment time the C-GET presentation context must be negotiated along with the C-STORE sub-operations which must be accomplished on the same association as the C-GET operation. Relational retrieve operation is NOT supported.

All unique keys have to be supplied according to the selected Query/Retrieve Level. The related tables in the C-FIND SCP section will give information about "U" marked key attributes. The Get SCP returns following status codes:

Table 29: *C-GET SCP return status*

Service Status	**Meaning**	**Protocol Codes**	**Related Fields**
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform sub operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures or Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

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Table 29: C-GET SCP return status

Service Status	Meaning	Protocol Codes	Related Fields
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

9.1.3.3 Real World Activity - Move SCP

9.1.3.3.1 Associated Real-World Activity - Move request to SCP

The associated Real-World activity is to respond to retrieve requests to an SCU. The SCP supports the query model Patient Root, Study Root and Patient/Study Only. The Storage Service Class Conformance Statement describes the C-STORE service which is generated by the C-MOVE service. Relational retrieve operation is NOT supported.

Multiple C-MOVE requests over the same association are NOT supported.

9.1.3.3.2 Accepted Presentation Contexts - Move SCP

The Siemens Med-WS DICOM application will accept Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Patient Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Study Root Query/Retrieve Move	1.2.840.10008.5.1.4.1.2.2.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None
Patient/Study Only Query/ Retrieve Move	1.2.840.10008.5.1.4.1.2.3.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCP	None

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Note

C-MOVE extended negotiation will not be supported by the SCP.
The order of preference for accepting Transfer Syntaxes is: 1. Explicit VR Little Endian, 2. Explicit VR Big Endian, 3. Implicit VR Little Endian.

9.1.3.3.3 SOP Specific Conformance Statement - Move SCP

At association establishment time the C-MOVE presentation context shall be negotiated. The C-STORE sub-operations is done on a different association, specified in the C-MOVE request, to transfer images to a remote SCP of the Storage Service Class. Relational retrieve operation is NOT supported.

All unique keys have to be supplied according to the selected Query/Retrieve Level. The related tables in the C-FIND SCP section will give information about "U" marked key attributes. Multiple C-MOVE requests over the same association are NOT supported.

The Move SCP returns following status codes:

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Table 30: *C-MOVE return status*

Service Status	Meaning	Protocol Codes	Related Fields
Refused	Out of Resources - Unable to calculate number of matches	A701	(0000,0902)
	Out of Resources - Unable to perform sub operations	A702	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Failed	Identifier does not match SOP Class	A900	(0000,0901) (0000,0902)
	Unable to process	C001	(0000,0901) (0000,0902)
Cancel	Sub-operations terminated due to Cancel Indication	FE00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Warning	Sub-operations Complete - One or more Failures or Warnings	B000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Pending	Sub-operations are continuing	FF00	(0000,1020) (0000,1021) (0000,1022) (0000,1023)
Success	Sub-operations Complete - No Failures or Warning	0000	(0000,1020) (0000,1021) (0000,1022) (0000,1023)

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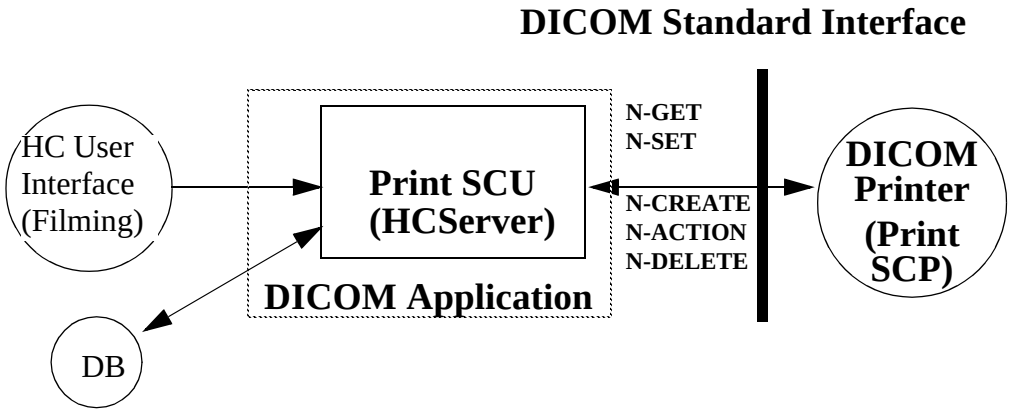
10 Implementation Model Print

The Print Management Service Classes define an application-level class of services which facilitate the printing of images on a hardcopy medium. The print management SCU and print management SCP are peer DICOM print management application entities. The Med-WS DICOM print application supports the print management DIMSE services to act as SCU.

10.1 Application Data Flow Diagram

The Med-WS DICOM network implementation is a Windows NT application and acts as SCU for the print management network service.

Figure 8: *Application Data Flow Diagram - Print SCU*



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10.2 Functional Definitions of Application Entities

The Print SCU is invoked by the user interface to setup film-sheet layout and whenever an image is ready to be printed on film. The Print SCU will hold and maintain all data needed to compile a complete film-sheet from the data (images, layout, configuration) received. Whenever a film-sheet is ready to print the related data is used to supply the Information to the SOP Classes of the Print Management Service Class. A queue is maintained in order to intermediately store several film-sheets in case of resource problems on printer. The SCU will only supply and require the mandatory SOP Classes of the Print Management Service Class.

10.3 Sequencing of real World Activities

Not applicable.

11 AE Specification Print

11.1 Print Management AE Specification

The Med-WS print management SCU (HCS) invokes print management DIMSE services to transfer images from the local AE to the remote SCP AE to print images with defined layout on a selected network-based DICOM hardcopy printer. This is done in a "full-page" print mode.

SIEMENS Med-WS DICOM products provide Standard Conformance to the following DICOM V3.0 Print Management Meta SOP Classes as an SCU:

Table 31: *Basic Grayscale Print Management Meta SOP Classes*

SOP Class Name	SOP Class UID
Basic Grayscale Print Management MetaSOP Class	1.2.840.10008.5.1.1.9
- Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
- Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
- Basic Grayscale Image Box SOP Class	1.2.840.10008.5.1.1.4
- Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14
Presentation LUt SOP Class	1.2.840.10008.5.1.1.23

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Table 32: *Basic Color Print Management Meta SOP Classes*

SOP Class Name	SOP Class UID
Basic Color Print Management MetaSOP Class	1.2.840.10008.5.1.1.18
- Basic Film Session SOP Class	1.2.840.10008.5.1.1.1
- Basic Film Box SOP Class	1.2.840.10008.5.1.1.2
- Basic Color Image Box SOP Class	1.2.840.10008.5.1.1.4.1
- Printer SOP Class	1.2.840.10008.5.1.1.16
Print Job SOP Class	1.2.840.10008.5.1.1.14

11.1.1 Association Establishment Policies

11.1.1.1 General

Whenever a film is completely set up and printed by command or automatism, the job is prepared for processing. As soon as the queue is ready to process, the job is activated and worked according the processing data. The related Print application will initiate an association to the print destination and process the printing of the related information.

The default PDU size used will be 32 KB.

11.1.1.2 Number of Associations

The Siemens Med-WS DICOM application initiates one association at a time for each different print device configured.

11.1.1.3 Asynchronous Nature

The Siemens Med-WS DICOM software does not support asynchronous communication (multiple outstanding transactions over a single association).

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11.1.1.4 Implementation Identifying Information

The Siemens Med-WS DICOM software provides a single Implementation Class UID of

- 1.2.12.2.1107.5.4.7

and an Implementation Version Name of

- “LEONARDO_V<SW-Version (e.g. A40A)>"

The <SW-Version> string is defined by the installed SW.

11.1.2 Association Initiation Policy

Triggered by the Print job queue the Print Management SCU establishes an association by using the DICOM association services. With the help of the N-GET request for the Printer SOP Class the Status is determined before printing.

With no problem encountered with the N-CREATE/N-SET Services for the related Basic Print SOP Classes the film sheet is set up for printing and the image(s) is(are) transferred to the printer device.

After the last film is printed from queue, the Print application will leave open the association for another 60 seconds. If a new film job is ready for printing within this time-limit, the job will be immediately processed over the still open association. If there is no new job, the association is closed if the time-out elapsed. This done to optimize automated printing.

During the "idle-time" (no open association to printer) the Print application will issue a cyclic camera status request (using N-GET of Printer SOP Class) every 5 minutes.

11.1.2.1 Real-World Activity - Print

11.1.2.1.1 Associated Real-World Activity - Printing a Printer Job Queue Entry

Whenever a film sheet is prepared by the user it is forwarded to the Printer Job queue. As soon as the associated Printer device is available the job is activated and association is set up.

The film sheet is internally processed, converted to a Standard/1-1 page and then the page image is sent. Status is controlled by awaiting any N-EVENT message all through the transfer until the last image or film-sheet is sent.

If the response from the remote application contains a status other than Success or Warning the association is aborted.

11.1.2.1.2 Proposed Presentation Contexts

The Siemens Med-WS DICOM application will propose Presentation Contexts as shown in the following table:

Presentation Context Table					
Abstract Syntax		Transfer Syntax		Role	Extended
Name	UID	Name List	UID List		Negotiation
Basic Gray-scale Print Management Meta SOP class	1.2.840.10008.5.1.1.9	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic Color Print Management Meta SOP class	1.2.840.10008.5.1.1.18	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic film session SOP class	1.2.840.10008.5.1.1.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic film box SOP class	1.2.840.10008.5.1.1.2	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Basic gray-scale image box SOP class	1.2.840.10008.5.1.1.4	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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Basic color image box SOP class	1.2.840.10008.5.1.1.4.1	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Printer SOP class	1.2.840.10008.5.1.1.16	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Print Job SOP class	1.2.840.10008.5.1.1.14	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None
Presentation LUT SOP class	1.2.840.10008.5.1.1.23	Implicit VR Little Endian Explicit VR Little Endian Explicit VR Big Endian	1.2.840.10008.1.2 1.2.840.10008.1.2.1 1.2.840.10008.1.2.2	SCU	None

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11.1.2.1.3 SOP Specific Conformance - Meta SOP Classes

The Siemens Med-WS DICOM print management SCU conforms to the DICOM Basic Gray-scale Print Management Meta SOP Class and the Basic Color Print Management Meta SOP Class.

The application uses a setting platform to define the properties of the connected DICOM SCP, e.g.:

- maximum number of print jobs in the queue
- maximum number of print copies
- supported film sizes of the connected DICOM SCP
- supported film formats of the DICOM SCP
- lookup table definition.

The printing is only suspended in the case of a failure return status of the SCP.

11.1.2.1.3.1 Basic film session SOP class

The Basic Film Session information object definition describes all the user defined parameters which are common for all the films of a film session. The Basic Film Session refers to one or more Basic Film Boxes and that are printed on one hardcopy printer.

The Med-WS DICOM print management SCU supports the following DIMSE Service elements for the Basic Film Session SOP Class as SCU:

- N-CREATE
- N-DELETE

The Basic Film Session SOP Class N-CREATE-RQ (SCU) uses the following attributes:

Table 33: *Used Basic Film Session N-CREATE-RQ attributes*

Attribute name	Tag	Usage SCU	Supported Values
Number of Copies	(2000,0010)	U	
Medium Type	(2000,0030)	U	BLUE FILM CLEAR FILM PAPER
Film Destination	(2000,0040)	U	MAGAZINE PROCESSOR

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Session - see below:

Table 34: *Attributes of N-DELETE-RQ on Basic Film Session SOP Class*

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0000,1000) -> (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Session

The N-DELETE-RQ on the Basic Film Session SOP Class is used to remove the complete Basic Film Session SOP Instance hierarchy.

The Basic Film Session SOP class interprets the following status codes (from N_CREATE_RSP, N_DELETE_RSP messages):

Table 35: *Basic Film Session SOP status*

Service Status	Meaning	Protocol Codes
Failure	Film session SOP instances hierarchy does not contain film box SOP instances	C600
	Unable to create print job, print queue is full	C601
	Image size is larger than images box size	C603
Warning	Memory allocation not supported	B600
	Film session printing is not supported	B601
	Film box does not contain image box (empty page)	B602
Success	Film belonging to the film session are accepted for printing	0000

11.1.2.1.3.2 Basic Film Box SOP class

The Basic Film Box information object definition describes all the user defined parameter of one film of the film session. The Basic Film Box information description defines the presentation parameters which are common for all images on a given sheet of film.

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The Basic Film Box refers to one or more Image Boxes.

Supported Service Elements as SCU are:

- N-CREATE
- N-ACTION
- N-DELETE

The Basic Film Box SOP class N-CREATE-RQ message uses the following attributes (the actual values for each attribute depend on DICOM printer configuration within the Med-WS DICOM print management SCU)

Table 36: *Used Film Box N-CREATE-RQ attributes*

Attribute name	Tag	Usage SCU	Supported Values
Image Display Format	(2010,0010)	M	STANDARD\1,1
Referenced Film Session Sequence	(2010,0500)	M	
>Referenced SOP Class UID	(0008,1150)	M	1.2.840.10008.5.1.1.1
>Referenced SOP Instance UID	(0008,1155)	M	
Film Orientation	(2010,0040)	M	PORTRAIT
Film Size ID	(2010,0050)	M	8INx10IN, 10INx12IN, 10INx14IN, 11INx14IN, 14INx14IN, 14INx17IN, 24CMx24CM, 24CMx30CM
Magnification Type	(2010,0060)	M	BILINEAR, CUBIC, NONE, REPLICATE
Max Density	(2010,0130)	U	
Min Density	(2010,0120)	U	
Illumination	(2010,015E)	U	>0 Required if Presentation LUT is present
Reflective Ambient Light	(2010,0160)	U	>0 Required if Presentation LUT is present
Referenced Presentation LUT Sequence	(2050,0500)	U	

The N-CREATE-RSP message from the Print SCP includes the Referenced Image Box Sequence with SOP Class/Instance UID pairs which will be kept internally to be further used for the subsequent Basic Image Box SOP Class N-SET-RQ messages.

When all Image Boxes (including parameters) for the film-sheet have been set, the Med-WS DICOM print manager will issue a N-ACTION-RQ message with the SOP Instance UID of the Basic Film Box and the Action Type ID of 1.

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The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requests (e.g. N-DELETE-RQ) on the Basic Film Box - see below:

Table 37: *Attributes of N-DELETE-RQ on Basic Film Box SOP Class*

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0000,1000) -> (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Basic Film Box

The Basic Film Box SOP class interprets the following status codes:

Tabelle 38: *Basic Film Box SOP status*

Service Status	Meaning	Protocol Codes
Failure	Unable to create print job; print queue is full	C602
	Image size is larger than image box size	C603
Warning	Film box does not contain image box (empty page)	B603
	Requested MinDensity or MaxDensity outside of Printer's operating range	B605
Success	Film accepted for printing	0000

11.1.2.1.3.3 Basic Grayscale Image Box SOP Class

The Basic Grayscale Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Grayscale Image Box SOP Class uses only the N-SET-RQ with the following attributes:

Table 39: *Mandatory Basic Grayscale Image Box N-SET attributes*

Attribute name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
Basic Grayscale Image Sequence	(2020,0110)	M	
>Samples Per Pixel	(0028,0002)	M	1
>Photometric Interpretation	(0028,0004)	M	MONOCHROME2
>Rows	(0028,0010)	M	
>Columns	(0028,0011)	M	
>Pixel Aspect Ratio	(0028,0034)	M	
>Bits Allocated	(0028,0100)	M	8
>Bits Stored	(0028,0101)	M	8

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Table 39: *Mandatory Basic Grayscale Image Box N-SET attributes*

Attribute name	Tag	Usage SCU	Supported Values
>High Bit	(0028,0102)	M	7
>Pixel Representation	(0028,0103)	M	0
>Pixel Data	(7FE0,0010)	M	

The Grayscale Image Box SOP class interpret the following status codes:

Table 40: *Basic Grayscale Image Box SOP status*

Service Status	Meaning	Protocol Codes
Warning	Requested MinDensity or MaxDensity outside of Printer's operating range	B605
Failure	Image contains more pixel than printer can print in Image Box	C603
	Insufficient memory in printer to store the image	C605
Success		0000

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11.1.2.1.3.4 Basic Color Image Box SOP Class

The Basic Color Image Box information object definition is the presentation of an image and image related data in the image area of a film. The Basic Image Box information describes the presentation parameters and image pixel data, which apply to a single image of a sheet of film.

The Color Image Box SOP Class uses only the N-SET-RQ with the following attributes:

Table 41: *Mandatory Basic Color Image Box N-SET attributes*

Attribute name	Tag	Usage SCU	Supported Values
Image Position	(2020,0010)	M	1
Basic Color Image Sequence	(2020,0111)	M	
>Samples Per Pixel	(0028,0002)	M	3
>Photometric Interpretation	(0028,0004)	M	RGB
>Planar Configuration	(0028,0006)	M	0
>Rows	(0028,0010)	M	
>Columns	(0028,0011)	M	
>Pixel Aspect Ratio	(0028,0034)	M	
>Bits Allocated	(0028,0100)	M	8
>Bits Stored	(0028,0101)	M	8
>High Bit	(0028,0102)	M	7
>Pixel Representation	(0028,0103)	M	0

Table 41: *Mandatory Basic Color Image Box N-SET attributes*

Attribute name	Tag	Usage SCU	Supported Values
>Pixel Data	(7FE0,0010)	M	

The Color Image Box SOP class interpret the following status codes:

Table 42: *Basic Color Image Box SOP status*

Service Status	Meaning	Protocol Codes
Warning	Image size larger than image box size	B604
Failure	Image contains more pixel than printer can print in Image Box	C603
	Insufficient memory in printer to store the image	C605
Success		0000

11.1.2.1.3.5 Presentation LUT SOP Class

The objective of the Presentation LUT is to realize image hardcopy printing tailored for specific modalities, applications and user preferences.

The output of the Presentation LUT is Presentation Values (P-Values). P-Values are approximately related to human perceptual response. They are intended to facilitate common input for hardcopy. P-Values are intended to be independent of the specific class or characteristics of the hardcopy device.

The Presentation LUT SOP Class uses only the N-CREATE-RQ with the following attributes:

Table 43: *Used Presentation LUT N-CREATE-RQ attributes*

Attribute name	Tag	Usage SCU	Supported Values
Presentation LUT Shape	(2050,0020)	U	IDENTITY

The affected SOP Instance UID received with N-CREATE-RSP message will be kept internally and used for later requestson the Basic Film Box (N-CREATE-RQ) and on the Presentation LUT (N-DELETE-RQ) - see below:

Table 44: *Attributes of N-CREATE-RSP on Presentation LUT SOP Class*

Attribute Name	Tag	Source of Information
Requested SOP Instance UID	(0000,1000) -> (0000,1001)	Affected SOP Instance UID of N-CREATE-RSP on Presentation LUT

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The Presentation LUT SOP class interprets the following status codes:

Tabelle 45: *Presentation LUT SOP status*

Service Status	Meaning	Protocol Codes
Warning	Requested MinDensity or MaxDensity outside of HCD's operating range. HCD will use its respective minimum or maximum density value instead.	B605
Success	Presentation LUT successfully crreated	0000

11.1.2.1.3.6 Printer SOP Class

The Printer SOP Class is the possibility to monitor the status of the hardcopy printer in a synchronous and an asynchronous way.

The SCU uses the mandatory N-EVENT Report DIMSE service to monitor the changes of the printer status in an asynchronous way.

It can directly ask the Printer (SCP) for its status or receive Events from the Printer asynchronously:

- N-GET as SCU
- N-EVENT-REPORT as SCU

In both cases the following information is supported:

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Table 46: *Used Printer N-EVENT report attributes*

Event type name	Event	Attributes	Tag	Usage SCU
Normal	1			
Warning	2	Printer Status Info	(2110,0020)	U
Failure	3	Printer Status Info	(2110,0020)	U

Table 47: *Mandatory Printer N-GET-RSP, N-EVENT-REPORT-RQ attributes*

Attribute name	Tag	Usage SCP	supported values
Printer Status	(2110,0010)	M	NORMAL, FAILURE, WARNING
Printer Status Info	(2110,0020)	M	see tables in the Annex for details

Note

For a detailed description on how Med-WS reacts on different printer status messages, please refer to the Annex section "DICOM Print SCU – detailed status displays".

11.1.2.1.3.7 Print Job SOP Class

The Print Job SOP Class is the possibility to monitor the execution of the print process.

The Med-WS DICOM Print Management application supports the optional N-EVENT-REPORT DIMSE Service to receive the changes of the Print Job Status in an asynchronous way.

It can receive Events from the Print SCP asynchronously:

- N-EVENT-REPORT

The following information is supported:

Table 48: *Used Print Job N-EVENT report attributes*

Event type name	Event	Attributes	Tag	Usage SCU
Normal	1	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Printing	2	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Done	3	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U
Failure	4	Execution Status Info	(2100,0030)	U
		Print Job ID	(2100,0010)	- (Print Queue Management SOP Class not supported)
		Film Session Label	(2000,0050)	U
		Printer Name	(2110,0030)	U

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Note

For a detailed description on how Med-WS reacts on different printer status messages, please refer to the Annex section “DICOM Print SCU – detailed status displays”.

12 Communication Profiles

12.1 Supported Communication Stacks

The Siemens Med-WS DICOM application provide DICOM V3.0 TCP/IP Network Communication Support as defined in Part 8 of the DICOM Standard.

12.1.1 TCP/IP Stack

The Siemens Med-WS DICOM application uses the TCP/IP stack from the Windows NT system upon which it executes. It uses the MergeCOM-3 subroutine library from Merge Technologies Inc. that is based on a Berkeley socket interface.

12.1.1.1 API

The Siemens Med-WS DICOM application uses the MergeCOM library that is based on a TCP/IP socket interface.

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12.1.1.2 Physical Media Support

The Siemens Med-WS DICOM application is indifferent to the physical medium over which TCP/IP executes; it inherits this from the Windows NT system upon which it executes.

13 Extensions/Specializations/Privatizations

13.1 Standard Extended/Specialized/Private SOPs

Please refer to Annex for further informations on these topics. A detailed overview is given there.

13.2 Private Transfer Syntaxes

Not applicable.

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14 Configuration

14.1 AE Title / Presentation Address Mapping

To ensure unique identification within the network the hostname should be used as part of the AE Titles (see examples below, hostname = axwsca1). The string can be up to 16 characters long and must not contain any extended characters, only 7-bit ASCII characters (excluding Control Characters) are allowed according to DICOM Standard.

14.1.1 DICOM Verification

The Verification Service uses the AE configuration of the DICOM Service that is checked with the C-ECHO message. e.g. Verification will use the Storage AE, if initiated to check the configuration of a remote DICOM node.

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14.1.2 DICOM Storage AE Title

The DICOM Storage application provides the application entity title which can be configured via Service UI:

e.g. STU_AXWSCA1

The port number is set to the fixed value of

104

14.1.3 DICOM Query/Retrieve AE Title

The DICOM Query/Retrieve application uses the same application entity title as the DICOM Storage AE.

14.1.4 DICOM Print AE Title

The DICOM Print application provides the application entity title:

e.g. PRI_AXWSCA1 *(No input of AETs starting with a numeric char is possible)*

The port number is set to the fixed value of

108

14.2 Configurable Parameters

The Application Entity Titles, host names and port numbers for the remote AE are configured using the Siemens Med-WS Service/Installation Tool. For each AET the list of services supported can be configured.

14.2.1 Storage and Query/Retrieve

The Siemens Med-WS Service/Installation Tool can be used to set the AET's, port-numbers, host-names, IP-addresses and capabilities for the remote nodes (SCP's). The service user can select transfer syntaxes, compression modes and query models for each SCP separately.

Additional configurable parameters for Storage Commitment are:

When acting as SCU:

- flag to indicate whether the association will be kept open to receive the response or to close the association and be prepared to receive the response on another association.
- time-out for N-EVENT-REPORT in hours and minutes (applicability of transaction UID) (default 1h0m). In case the flag is set to keep the association open, this is also the time the association is kept open to wait for N-EVENT-REPORT.

When acting as SCP:

- flag to indicate if an archive system is installed (is set to FALSE for AX-WS role)

Additional configurable parameters for EndoMap application:

EndoMap application allows to set the Export format of the images. In the "DICOM" tabcard of the options "Export as grayscale" can be selected.

14.2.2 Print

The Siemens Med-WS Service/Installation Tool can be used to configure the SCP (DICOM printer). The AET, host-name, IP-address and port-number can be set.

14.3 Default Parameters

This installation tool also uses some default parameters:

- max PDU size set to 32768 Bytes (32 kB)
- time-out for accepting/rejecting an association request: 240 s
- time-out for responding to an association open/close request: 240 s
- time-out for accepting a message over network: 240 s
- time-out for waiting for data between TCP/IP-packets: 240 s

The time-outs for waiting for a Service Request/Response message from the remote node are as follows:

- for Storage SCP/SCU: 600 s
- for Storage Commitment SCU:
  time-out for Response to N-ACTION: 1h0m
- for Query/Retrieve SCP/SCU: 600 s

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- for Print Management SCU:
  - time-out for Response to N-SET-RQ: 240 s
  - time-out for Response to other Requests: 60 s

15 Support of Extended Character Sets

The Siemens Med-WS DICOM application supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

Also the Japanese language character sets JIS X 0201 (ISO-IR 13 Japanese katakana and ISO-IR 14 Japanese romaji), JIS X 0208 (ISO-IR 87 Japanese kanji) and JIS X 0212 (IOS-IR 159 Supplementary Japanese kanji) are supported.

When there is a mismatch between the SCS tags (0008,0005) and the characters in an IOD received by the system, then the following measures are taken to make the characters DICOM con-form:

Try to import with ISO_IR 100. If ISO_IR 100 fails, convert each illegal character to a ’?’.

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syngo Offline Media Application Profile

Will contain a *syngo*- specific Application Profile Class.

Structure of this Application Profile is defined in Part 11 of the 2000 DICOM Standard.

It is needed to describe the requirements for Offline Media Storage of the private IOD (Non-Image IOD).

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1 Class and Profile Identification

This document defines an Application Profile Class for "*syngo*® speaking[1]" modalities or applications.

The identifier for this class shall be PRI-SYNGO. This class is intended to be used for interchange of extended and private Information Objects via CD-R or re-writable magneto-optical disk (MOD) offline media between dedicated acquisition or workstation modalities build from a common *syngo* architecture.

The specific application profiles in this class are shown in Table 1:

Table 1: *PRI-SYNGO Universal Angio/Radio Class Profiles*

Application Profile	Identifier	Description
"*syngo* speaking" System on CD-R	PRI-SYNGO-CD	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).
"*syngo* speaking" System on 2.3 GB MOD	PRI-SYNGO-MOD23	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).
"*syngo* speaking" System on 4.1 GB MOD[a]	PRI-SYNGO-MOD41	Handles interchange of Composite SOP Instances and privately defined SOP Instances (Siemens Non-Image IOD).
"*syngo* speaking" System on Floppy Disk	PRI-SYNGO-FD	Handles interchange of Waveform SOP instances and privately defined SOP Instances (Siemens Non-Image IOD).

a. Definition of this profile is done due to approval of DICOM Supplement 62.

Equipment claiming conformance for this *syngo* Application Profile Class shall make a clear statement on handling of the private defined SOP Instances.

2 Clinical Context

This application profile facilitates the interchange of original acquired and derived images and private data related to them. Typical media interchange would be from in-lab acquisition equipment to dedicated workstations and archive systems with specific extensions to handle the private data objects (in both directions).

1. *syngo* is registered trademark of Siemens AG.

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Additionally, images (from MR, CT, US, XA) used to prepare procedures, multi-modality images (e.g. integrated US) and images derived from primary diagnostic images, such as annotations, quantitative analysis images, reference images, screen capture images may be interchanged via this profile.

2.1 Roles and Service Class Options

This Application Profile uses the Media Storage Service Class defined in PS 3.4 with the Interchange Option.

The Application Entity shall support one or more of the roles of File Set Creator (FSC), File Set Reader (FSR), and File Set Updater (FSU), defined in PS 3.10.

2.1.1 File Set Creator

The Application Entity acting as a File-Set Creator generates a File Set under the PRI-SYNGO Application Profiles.

File Set Creators shall be able to generate the Basic Directory SOP Class in the DICOMDIR file with all the subsidiary Directory Records related to the Image SOP Classes and Private SOP Classes stored in the File Set.

In case of PRI-SYNGO-CD Profile, the FSC shall offer the ability to either finalize the disc at the completion of the most recent write session (no additional information can be subsequently added to the disc) or to allow multi-session (additional information may be subsequently added to the disc).

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Note

A multiple volume (a logical volume that can cross multiple physical media) is not supported by this Application Profile Class. If a set of Files, e.g., a Study, cannot be written entirely on one CD-R, the FSC will create multiple independent DICOM File-Set such that each File-Set can reside on a single CD-R medium controlled by its individual DICOMDIR file. The user of the FSC can opt to use written labels on the discs to reflect that there is more than one disc for this set of files (e.g., a Study).

2.1.2 File Set Reader

The role of the File Set Reader shall be used by Application Entities which receive the transferred File Set.

File Set Readers shall be able to read all the defined SOP Instances files defined for the specific Application Profiles to which a conformance claim is made, using all the defined Transfer Syntaxes.

2.1.3 File Set Updater

The role of the File Set Updater shall be used by Application Entities which receive a transferred File Set and update it by the addition of processed information.

File Set Updaters shall be able to read and update the DICOMDIR file. File-Set Updaters do not have to read the image/private information objects. File-Set Updaters shall be able to generate any of the SOP Instances files defined for the specific Application Profiles to which a conformance claim is made, and to read and update the DICOMDIR file.

In case of PRI-SYNGO-CD Profile, the FSU shall offer the ability to either finalize a disc at the completion of the most recent write session (no additional information can be subsequently added to the disc) or to allow multi-session (additional information may be subsequently added to the disc).

Note (for CD-R)

If the disc has not been finalized, the File-Set Updater will be able to update information assuming there is enough space on the disc to write a new DICOMDIR file, the information, and the fundamental CD-R control structures. CD-R control structures are the structures that inherent to the CD-R standards; see PS 3.12

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3 PRI-SYNGO Profiles

3.1 SOP Classes and Transfer Syntaxes

This Application Profiles are based on the Media Storage Service Class with the Interchange Option.

Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
Basic Directory	1.2.840.10008.1.3.10	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	M
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	M	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	M	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	M

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Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	O	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	M	M	M
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	JPEG Lossy (baseline or extended)1.2.840.10008.1.2.4.501.2.840.10008.1.2.4.51	O	O	O
DX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	RLE Lossless1.2.840.10008.1.2.5	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	M
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	M	M	M
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	JPEG Lossy (baseline or extended)1.2.840.10008.1.2.4.501.2.840.10008.1.2.4.51	O	O	O
DX Image – For Presentation	1.2.840.10008.5.1.4.1.1.1.1	RLE Lossless1.2.840.10008.1.2.5	O	O	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

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Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CR Image	1.2.840.10008.5.1.4.1.1.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
CR Image	1.2.840.10008.5.1.4.1.1.1	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CT Image	1.2.840.10008.5.1.4.1.1.2	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
CT Image	1.2.840.10008.5.1.4.1.1.2	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
MR Image	1.2.840.10008.5.1.4.1.1.4	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
MR Image	1.2.840.10008.5.1.4.1.1.4	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

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Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
IOX Image - For Processing	1.2.840.10008.5.1.4.1.1.1.3.1	RLE Lossless1.2.840.10008.1.2.5	O	O	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
IOX Image - For Presentation	1.2.840.10008.5.1.4.1.1.1.3	RLE Lossless1.2.840.10008.1.2.5	O	O	O
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	-	M	-
Ultrasound Image (retired)	1.2.840.10008.5.1.4.1.1.6	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

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Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	M	O
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	RLE Lossless 1.2.840.10008.1.2.5	O	M	O
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	-	M	-
Ultrasound Multi-frame Image (retired)	1.2.840.10008.5.1.4.1.1.3	RLE Lossless1.2.840.10008.1.2.5	-	M	-
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	M	O
Ultrasound Multiframe Image	1.2.840.10008.5.1.4.1.1.3.1	RLE Lossless1.2.840.10008.1.2.5	O	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O

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Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
NM Image	1.2.840.10008.5.1.4.1.1.20	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
NM Image	1.2.840.10008.5.1.4.1.1.20	RLE Lossless 1.2.840.10008.1.2.5	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
PET Image	1.2.840.10008.5.1.4.1.1.128	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
PET Image	1.2.840.10008.5.1.4.1.1.128	RLE Lossless1.2.840.10008.1.2.5	O	O	O
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Dose	1.2.840.10008.5.1.4.1.1.481.2	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossless Process 14 (selection value 1) 1.2.840.10008.1.2.4.70	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	JPEG Lossy (baseline or extended) 1.2.840.10008.1.2.4.50 1.2.840.10008.1.2.4.51	O	O	O
RT Image	1.2.840.10008.5.1.4.1.1.481.1	RLE Lossless1.2.840.10008.1.2.5	O	O	O

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Table 2: *PRI-SYNGO SOP Classes and Transfer Syntaxes*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax UID	FSC	FSR	FSU
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Plan	1.2.840.10008.5.1.4.1.1.481.5	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
RT Structure Set	1.2.840.10008.5.1.4.1.1.481.3	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O
CSA Non-Image	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	M	O
Detached Patient Management	1.2.840.10008.3.1.2.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	O	seeDCS	O
Waveform Storage SOP Classes	1.2.840.10008.5.1.4.1.1.9.1.1 1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.3 1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1 1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1	M	M	O
Waveform Storage SOP Classes	1.2.840.10008.5.1.4.1.1.9.1.1 1.2.840.10008.5.1.4.1.1.9.1.2 1.2.840.10008.5.1.4.1.1.9.1.3 1.2.840.10008.5.1.4.1.1.9.2.1 1.2.840.10008.5.1.4.1.1.9.3.1 1.2.840.10008.5.1.4.1.1.9.4.1	Explicit VR Big Endian Uncompressed 1.2.840.10008.1.2.2	O	M	O

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FSC, FSR, FSU - denote the Requirements for those roles.

O - Optional

M - Mandatory

3.2 Physical Media and Media Formats

The PRI-SYNGO-CD Profile requires the 120mm CD-R physical media with the ISO/IEC 9660 Media Format, as defined in PS3.12.

The PRI-SYNGO-MOD23 Profile requires the 130mm 2.3 GB R/W MOD physical medium with the PCDOS Media Format, as defined in PS3.12.

The PRI-SYNGO-MOD41 Profile requires the 130mm 4.1 GB R/W MOD physical medium with the PCDOS Media Format, as approved by DICOM Suppl. 62.

The PRI-SYNGO-FD Profile requires the 1.44 MB diskette physical medium with the PCDOS Media Format, as defined in PS3.12.

3.3 Directory Information in DICOMDIR

Conforming Application Entities shall include in the DICOMDIR File the Basic Directory IOD containing Directory Records at the Patient and subsidiary levels appropriate to the SOP Classes in the File-set. All DICOM files in the File-set incorporating SOP Instances defined for the specific Application profile shall be referenced by Directory Records.

Note

DICOMDIRs with no directory information are not allowed by this Application Profile

Privately defined IODs will be referenced by "PRIVATE" Directory Records.

3.3.1 Basic Directory IOD Specialization

This Application Profile makes use of optional attributes of the Basic Directory IOD to support recognition of Patient's Storage Service request results in spanning multiple volumes (file sets). Therefore the File Set Descriptor File can be used and is then referenced by optional Basic Directory IOD attributes. If existent, the specified Descriptor File may be used by FSR applications. Any FSU, FSC shall make a clear Statement if the Descriptor File mechanism is used according to the specialization defined in this Application Profile.

The Descriptor Files shall have the following contents:

One single Line without any control-characters and according to the Basic Character-Set having the following defined text:

"MULTIVOLUME: xx of yy"

xx, yy are replaced by the actual Number of the volume (xx) and the Total Number of Volumes in the set (yy).

If used, the Descriptor File shall have the File ID "README" and reside in same directory level as the DICOMDIR. It is referenced by the attribute [0004,1141] File-set Descriptor File ID having the defined content of "README".

3.3.2 Additional Keys

File-set Creators and Updaters are required to generate the mandatory elements specified in PS 3.3, Annex F of the DICOM Standard. Table 3:*PRI-SYNGO Additional DICOMDIR Keys* specifies the additional associated keys. At each directory record level other additional data elements can be added, but it is not required that File Set Readers be able to use them as keys. Refer to the Basic Directory IOD in PS 3.3.

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Table 3: *PRI-SYNGO Additional DICOMDIR Keys*

Key Attribute	Tag	Directory Record Level	Type	Notes
Date of Birth	[0010,0030]	PATIENT	2C	required, if present in SOP Instance
Patient´s Sex	[0010,0040	PATIENT	2C	required, if present in SOP Instance
Series Date	[0008,0021]	SERIES	3	
Series Time	[0008,0031]	SERIES	3	
Institute Name	[0008,0080]	SERIES	2C	required, if present in SOP Instance
Institution Address	[0008,0081]	SERIES	2C	required, if present in SOP Instance
Series Description	[0008,103E]	SERIES	3	
Performing Physician´s Name	[0008,1050]	SERIES	2C	required, if present in SOP Instance
Image Type	[0008,0008]	IMAGE	1C	required, if present in SOP Instance
SOP Class UID	[0008,0016]	IMAGE	3	
SOP Instance UID	[0008,0018]	IMAGE	3	
Image Date	[0008,0023]	IMAGE	3	
Image Time	[0008,0033]	IMAGE	3	
Referenced Image Sequence	[0008,1140]	IMAGE	1C	required, if present in SOP Instance
>Referenced SOP Class UID	[0008,1150]	IMAGE		
>Referenced SOP Instance UID	[0008,1155]	IMAGE		
Image Position (Patient)	[0020,0032]	IMAGE	2C	required, if present in SOP Instance
Image Orientation (Patient)	[0020,0037]	IMAGE	2C	required, if present in SOP Instance
Frame of Reference UID	[0020,0052]	IMAGE	2C	required, if present in SOP Instance
Rows	[0028,0010]	IMAGE	3	
Columns	[0028,0011	IMAGE	3	
Pixel Spacing	[0028,0030]	IMAGE	1C	required, if present in SOP Instance
Calibration Image	[0050,0004]	IMAGE	2C	required, if present in SOP Instance
Icon Image Sequence	[0088,0200]	IMAGE	3	required for Image SOP Classes
>Samples per Pixel	[0028,0002]			1
>Photometric Interpretation	[0028,0004]			MONOCHROME2
>Rows	[0028,0010]			128 for XA, 64 for others
>Columns	[0028,0011]			128 for XA, 64 for others
>Bits Allocated	[0028,0100]			8

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Table 3: PRI-SYNGO Additional DICOMDIR Keys

Key Attribute	Tag	Directory Record Level	Type	Notes
>Bits Stored	[0028,0101]			8
>High Bit	[0028,0102]			7
>Pixel Representation	[0028,0103]			0
>Pixel Data	[7FE0,0010]			Icon Image

3.3.3 Private Directory Record Keys

Private Directory Records are supported by this Application Profile Class at the following Level - IMAGE. The PRIVATE Directory Records will have required elements in addition to the mandatory elements specified in PS 3.3.

Table 4: will list the additional required keys for PRIVATE Directory Records.

Table 4: PRI-SYNGO Additional PRIVATE Record Keys

Key Attribute	Tag	Type	Notes
Private Record UID	(0004,1432)	1	see Conformance Statement
SOP Class UID	[0008,0016]	1C	required, if present in SOP Instance
SOP Instance UID	[0008,0018]	1C	required, if present in SOP Instance
Image Type	[0008,0008]	3	
Acquisition Date	[0008,0022]	3	
Acquisition Time	[0008,0032]	3	
Acquisition Number	[0020,0012]	3	
CSA Data Type	[0029,xx08]	1	private owner code = SIEMENS CSA NON-IMAGE
CSA Data Version	[0029,xx09]	3	private owner code = SIEMENS CSA NON-IMAGE

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3.3.4 Icon Images

Directory Records of type SERIES or IMAGE may include Icon Images. The Icon Image pixel data shall be as specified in PS 3.3 "Icon Image Key Definition", and restricted such that Bits Allocated (0028,0100) and Bits Stored (0028,0101) shall be equal 8, and Rows (0028,0010) and Columns (0028,0011) shall be equal to 128 for XA Images and 64 for all other Images. The Photometric Interpretation (0028,0004) shall always be restricted to "MONOCHROME2".

PRIVATE Directory Records will not contain Icon Image information.

3.4 Other Parameters

This section defines other parameters common to all specific Application Profiles in the PRI-SYNGO class which need to be specified in order to ensure interoperable media interchange.

3.4.1 Multiframe JPEG Format

The JPEG encoding of pixel data shall use Interchange Format (with table specification) for all frames.

3.4.2 Attribute Value Precedence

The values of attributes contained in a Detached Patient Management SOP Instance referenced by a DICOMDIR PATIENT Directory Record shall take precedence over the values of those attributes contained in the SOP Instance referenced by a subsidiary Directory Record. The DICOMDIR Directory Records shall have key attribute values in accordance with this precedence.

Note

This allows patient identification and demographic information to be updated without changing the composite Image IOD files. The DICOMDIR file thus is critical in establishing the link between the updated information and the image. As an example, at the time an Image file was written, the patient's name therein was incorrect, or inconsistent with the Hospital Information System records. Subsequently, a Detached Patient management file with the corrected name is added to the file-set. The FSR should use the name from the Patientfile rather than in the image File.

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Application Profile Conformance Statement

This chapter will contain the Conformance Statement to all "Offline Media Application Profiles (inc. private extentions)" supported by the Med-WS archive options.

Those application profiles supported shall be:

- Basic Cardiac
- 1024 Extended Cardiac
- General Purpose CDR
- *syngo* private Application Profile Class

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1 Introduction

1.1 Purpose

This DICOM Conformance Statement is written according to part PS 3.2 of [1].

The applications described in this conformance statement are the SIEMENS Multimodality Workstation (Med-WS) products based on *syngo*® software. The Med-WS DICOM offline media storage service implementation acts as FSC,FSU and/or FSR for the specified application profiles and the related SOP Class instances.

1.2 Scope

This DICOM Conformance Statement refers to SIEMENS Med-WS based products using Med-WS software. The following table relates med-WS software names to SIEMENS products.

Table 1: *Siemens Med-Workstation DICOM Products*

Software Name	SIEMENS Med-WS Product
VB30A	LEONARDO Multimodality Workstation

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1.3 Definitions, Abbreviations

1.3.1 Definitions

DICOM	Digital Imaging and Communications in Medicine
DIMSE	DICOM Message Service Element
DIMSE-C	DICOM Message Service Element with Composite information objects

1.3.2 Abbreviations

ACR	American College of Radiology
AE	DICOM Application Entity
ASCII	American Standard Code for Information Interchange
DB	Database
DCS	DICOM Conformance Statement
FSC	File Set Creator
FSR	File Set Reader
FSU	File Set Updater

IOD	DICOM Information Object Definition
ISO	International Standard Organization
LEONARDO	AX-Workstation (for Angiographic/Radiographic viewing)
Med-WS	Multimodality Workstation
MOD	Magneto-Optical Disk
NEMA	National Electrical Manufacturers Association
O	Optional Key Attribute
PDU	DICOM Protocol Data Unit
R	Required Key Attribute
RWA	Real-World Activity
U	Unique Key Attribute

1.4 References

[1] Digital Imaging and Communications in Medicine (DICOM) 3.0, NEMA PS 3.1-15, 2000

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1.5 Connectivity and Inter operability

This Conformance Statement by itself does not guarantee successful inter operability of SIEMENS equipment with non-SIEMENS equipment. The user (user's agent) should be aware of the following issues:

- Inter operability

  Inter operability refers to the ability of application functions, distributed over two or more systems, to work successfully together. The integration of medical devices into a networks environment may require application functions that are not specified within the scope of DICOM. Consequently, using only the information provided by this Conformance Statement does not guarantee inter operability of SIEMENS equipment with non-SIEMENS equipment. It is the user's responsibility to analyze thoroughly the application requirements and to specify a solution that integrates SIEMENS equipment with non-SIEMENS equipment.

- Validation

  SIEMENS equipment has been carefully tested to assure that the actual implementation of the DICOM interface corresponds with this Conformance Statement.
  Where SIEMENS equipment is linked to non-SIEMENS equipment, the first step is to compare the relevant Conformance Statements. If the Conformance Statements indicate that successful information exchange should be possible, additional validation test will be necessary to ensure the functionality, performance, accuracy and stability of image and image related data. It is the responsibility of the user (or user's agent) to specify the appropriate test suite and to carry out the additional validation tests.

- New versions of the DICOM Standard

  the DICOM Standard will evolve in future to meet the user's growing requirements and to incorporate new features and technologies. SIEMENS is actively involved in this evolution and plans to adapt its equipment to future versions of the DICOM Standard. In order to do

so, SIEMENS reserves the right to make changes to its products or to discontinue its delivery. The user should ensure that any non-SIEMENS provider linking to SIEMENS equipment, also adapts to future versions of the DICOM Standard. If not, the incorporation of DICOM enhancements into SIEMENS equipment may lead to loss of connectivity (in case of networking) and incompatibility (in case of media).

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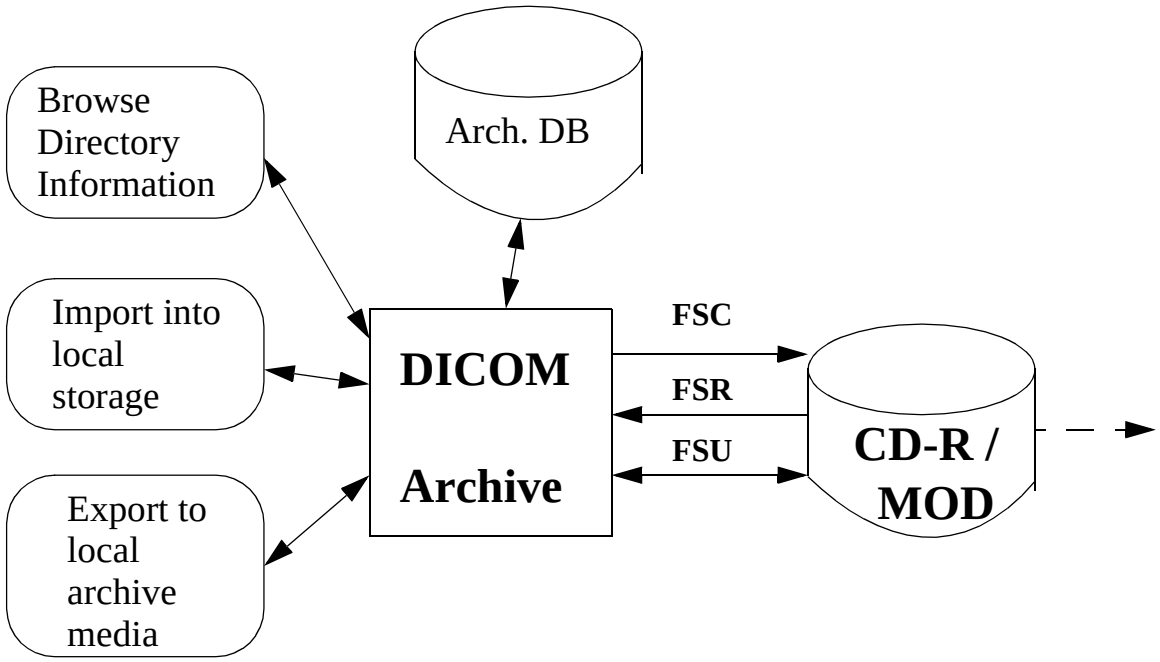
2 Implementation Model

2.1 Application Data Flow Diagram



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The DICOM archive application will serve as an interface to the CD-R and (optional) MOD offline medium device. It serves interfaces to include the offline media directory into the browser and to copy SOP instances to a medium or retrieve SOP Instances from medium into local storage.

The DICOM Archive application will support the 120mm CD-R medium, the 130mm 2.3GB R/W MOD and the 130mm 4.1[1] GB R/W MOD media.

The FSU role will update new SOP Instances only to media with pre-existing File-sets conforming to the Application Profiles supported.

The contents of the DICOMDIR will be temporarily stored in Archive-Database.

2.2 Functional definitions of AE's

The Med-WS DICOM offline media storage application consist of the DICOM Archive application entity serving all interfaces to access offline media. The DICOM Archive application is capable of

1. creating a new File-set onto an unwritten medium (Export to...).
2. updating an existing File-set by writing new SOP Instances onto the medium (Export to...).

1. the 4.1 GB media format is based on approval of DICOM Supplement 62.

3. importing SOP Instances from the medium onto local storage
4. reading the File-sets DICOMDIR information into temporary database and pass it to display applications.

2.3 Sequencing of Real World Activities

The DICOM Archive application will not perform updates before the Directory information of the DICOMDIR is completely read.

When performing updates, the SOP instances are checked for existence before updating. Duplicate instances will be avoided.

2.4 File Meta Information Options

The Implementation Class UID is:

- 1.3.12.2.1107.5.99.2

and an Implementation Version Name of

- "SIEMENS_LEOVB30B"

The <SW-Version> string is defined by the installed SW.

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3 AE Specifications

3.1 DICOM Archive Specification

The DICOM Archive provides Standard conformance to Media Storage Service Class (Interchange Option). In addition Augmented conformance is provided to store extra data attributes important for the full feature support of the Med-WS product SW. Details are listed in Table 2:.

Table 2: *Application profiles, Activities, and Roles for DICOM Archive*

Application Profiles Supported	Real World Activity	Role	SC Option
PRI-SYNGO-CD PRI-SYNGO-MOD23 (option) PRI-SYNGO-MOD41 (option) AUG-XA1K-CD *1	Browse Directory Information	FSR	Interchange
	Import into local Storage	FSR	Interchange
	Export to local archive media	FSC, FSU	Interchange
STD-GEN-CD STD-XABC-CD STD-XA1K-CD	Browse Directory Information	FSR	Interchange
	Import into local Storage	FSR	Interchange

*1 - With no Private SOP Class used, the PRI-SYNGO-CD Profile definitions are appropriate to describe the Augmentation of the STD-XA1K-CD Profile.

On Med-WS based Workstation Products the Private Extended *syngo* Profile (PRI-SYNGO-CD or optional the PRI-SYNGO-MOD23 or PRI-SYNGO-MOD41) will be preferably used by the system. The General Purpose Interchange Profile (STD-GEN-CD), Basic Cardiac Profile (STD-XABC-CD) and 1024 X-Ray Angiographic Profile (STD-XA1K-CD) will be supported with read capability of the related media.

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3.1.1 File Meta Information for the Application Entity

The Source Application Entity Title is set by configuration. See Chapter "Configuration" for details.

3.1.2 Real-World Activities for this Application Entity

3.1.2.1 Real-World Activity: Browse Directory Information

The DICOM Archive application acts as FSR using the interchange option when requested to read the media directory.

The DICOM archive application will read the DICOMDIR and insert those directory entries, that are valid for the application profiles supported, into a local database. The database can then be used for browsing media contents.

Note

IconImageSQ is also supported in DICOMDIR. But only those IconImages with BitsAllocated (0028,0100) equal to 8 and size of 64x64 or 128x128 pixels are imported into database and are visible in the Browser.

3.1.2.1.1 Application Profiles for the RWA: Browse Directory Information

See Table 2: for the Application Profiles listed that invoke this Application Entity for the Browse Directory Information RWA.

3.1.2.2 Real-World Activity: Import into local Storage

The DICOM Archive application acts as FSR using the interchange option when requested to read SOP Instances from the medium into the local storage.

The SOP Instance selected from the media directory will be copied into the local storage. Only SOP Instances, that are valid for the application profile supported and are listed as supported by the Storage SCP Conformance section (Network DCS,), can be retrieved from media storage. This is due to the fact that the Browse Directory Information will filter all SOP Instances not matching the Application profiles supported.

During operation no "Attribute Value Precedence" is applied to the SOP Instances. Detached Patient Management is not supported.

For media conforming to the STD-GEN-CD Profile the following SOP classes will be supported as an FSR:

Table 3: *STD-GEN-CD Supported SOP Classes for FSR role*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax and UID
X-Ray Angiographic Image	1.2.840.10008.5.1.4.1.1.12.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
X-Ray Radiofluoroscopic Image	1.2.840.10008.5.1.4.1.1.12.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Secondary Capture Image	1.2.840.10008.5.1.4.1.1.7	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
CR Image	1.2.840.10008.5.1.4.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
CT Image	1.2.840.10008.5.1.4.1.1.2	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
MR Image	1.2.840.10008.5.1.4.1.1.4	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
DX Image- For Processing	1.2.840.10008.5.1.4.1.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
DX Image- For Presentation	1.2.840.10008.5.1.4.1.1.1.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

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Table 3: *STD-GEN-CD Supported SOP Classes for FSR role*

Information Object Definition	Service Object Pair Class UID	Transfer Syntax and UID
Ultrasound Multi-Frame Image	1.2.840.10008.5.1.4.1.1.3.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
Ultrasound Image	1.2.840.10008.5.1.4.1.1.6.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
NM Image	1.2.840.10008.5.1.4.1.1.20	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1
CSA Non-Image	1.3.12.2.1107.5.9.1	Explicit VR Little Endian Uncompressed 1.2.840.10008.1.2.1

3.1.2.2.1 Application Profiles for the RWA: Import into local Storage

See Table 2: for the Application Profiles listed that invoke this Application Entity for the Import into Local Storage RWA.

3.1.2.3 Real-World Activity: Export to local Archive Media

The DICOM Archive application acts as FSU (for media with existing DICOM file-set) or FSC (media not initialized) using the interchange option when requested to copy SOP Instances from the local storage to local Archive medium.

The DICOM Archive application will receive a list of SOP Instances to be copied to the local archive medium. According to the state of the medium inserted (new medium, Medium with DICOM file-set) the validity of the SOP Instances according to the applicable profile is checked. Only valid SOP Instances are accepted.

When the DICOM archive application is requested to copy SOP Instances, the preferred application profile according configuration (AUG-XA1K-CD or PRI-SYNGO-xxx) will be used to validate and copy the referred SOP Instances. When creating a new file-set no Descriptor File will be allocated and the related ID is not used.

The DICOM archive application will not close the medium.

With the "Export 512 to ..." function of the Angio Viewer or if configured as default transfer mode for the viewer, a copy of images in Cardiac Format (512x512, 8Bit) can be written onto medium. Please refer to the Storage section "Send 512 to ..." RWA description to learn more about the type of conversion that is performed on the Instances.

3.1.2.3.1 Application Profiles for the RWA: Export to local Archive Media

See Table 2: for the Application Profiles listed that invoke this Application Entity for the Export to local Archive Media RWA.

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4 Augmented and Private Profiles

4.1 Augmented Application Profiles

4.1.1 AUG-XA1K-CD

With no private Siemens Non-Images stored onto Medium, the definitions of the PRI-SYNGO-CD Profile are applicable to denote the augmentations for the STD-XA1K-CD Standard Profile.

Storage of Private Information Objects will only be supported with reference to a Private Application Profile (see next section).

4.2 Private Application Profiles

4.2.1 PRI-SYNGO-CD, -MOD23, -MOD41

The DICOM Archive application is conforming to the PRI-SYNGO application profile class provided in "syngo Offline Media Application Profile" . Please refer to next section for more information on specializations and extensions in accordance to this Application Profile Class.

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5 Extensions, Specializations and Privatization of SOP Classes and Transfer Syntaxes

The SOP Classes listed refer in majority to those created by the equipment to which this conformance Statement is related to. For SOP classes not listed in this section, please refer to the Storage section of the DICOM Conformance Statement of the product. This will include all SOP Instances that can be received and displayed and therefor will be included into offline media storage even though these SOP Instances are not created by the equipment serving the Media Storage Service.

5.1 SOP Specific Conformance Statement for Basic Directory

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5.1.1 Extension, Specialization for SIEMENS Non-Image Objects

According to the PRI-SYNGO Application Profile Class the usage of the Private Creator UIDs and further optional keys for the Directory Records referring to SIEMENS Non-Image Objects are listed in the following tables.

Table 4: *Basic Directory Extension for Non-Image Objects*

Attribute	Tag	Value used
Private Record UID	[0004,1432]	1.3.12.2.1107.5.9.1
SOP Class UID	[0008,0016]	1.3.12.2.1107.5.9.1

For those "Non-Images" no Icon Image Sequence will be generated.

6 Configuration

6.1 AE Title Mapping

6.1.1 DICOM Media Storage AE Title

The DICOM Storage application provides the application entity title:

CsaImageManager

7 Support of Extended Character Sets

The Siemens Med-WS DICOM archive application supports the ISO 8859 Latin 1 (ISO-IR 100) character set.

Also the Japanese language character sets JIS X 0201 (ISO-IR 13 Japanese katakana and ISO-IR 14 Japanese romaji), JIS X 0208 (ISO-IR 87 Japanese kanji) and JIS X 0212 (ISO-IR 159 Supplementary Japanese kanji) are supported.

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A Annex

A.1 SIEMENS Private Non-Image IOD

For encoding binary data-streams not representing image data, Siemens has created a private "Non-Image IOD" according to the rules governed by the DICOM Standard. The following section will roll-out the definition of this Private IOD. It can be communicated with Network Storage Service and Offline Media Storage Services.

The Siemens "Non-Image IOD" is identified by a private Non-Image Storage SOP Class UID of

"1.3.12.2.1107.5.9.1"

A.1.1 Siemens Non-Image IOD - E-R Model

The E-R model in A.1.2 depicts those components of the DICOM Information Model which directly refer to the Siemens Non-Image IOD. The Frame of Reference IE, Overlay IE, Modality Lookup-Table IE, VOI Lookup-Table IE and Curve IE are not components of the Siemens Non-Image IOD.

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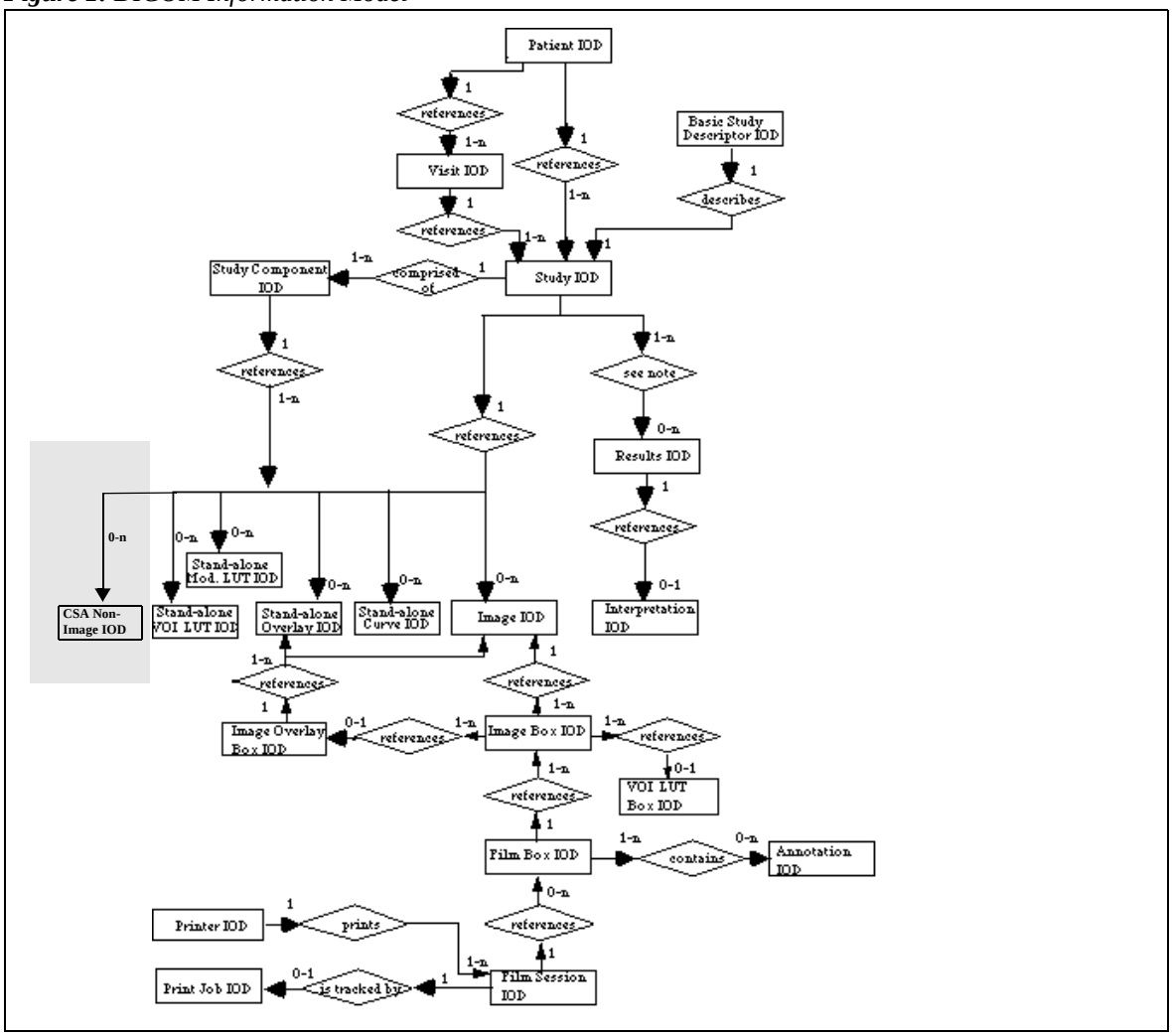
Figure 1: *DICOM Information Model*



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A.1.2 Siemens Non-Image IOD - Module Table

Table 1: *CSA Non-Image IOD Modules*

IE	Module	Reference	Usage
Patient	Patient	[1] PS3.3 C.7.1.1	M
Study	General Study	[1] PS3.3 C.7.2.1	M
	Patient Study	[1] PS3.3 C.7.2.2	U
Series	General Series	[1] PS3.3 C.7.3.1	M
Equipment	General Equipment	[1] PS3.3 C.7.5.1	U
CSA	CSA Image Header	A.2.1	U
	CSA Series Header	A.2.2	U
	MEDCOM Header	A.2.3	U
	CSA Non-Image	A.1.3.1	M
	SOP Common	[1] PS3.3 C.12.1	M

A.1.3 Siemens Non-Image IOD - Modules

A.1.3.1 CSA Non-Image Module

The table in this section contains private IOD Attributes that describe CSA Non-Images..

Table 2: *CSA Non-Image Module*

Attribute Name	Tag	Owner	Type	Notes
Image Type	(0008,0008)	-	3	Image identification characteristics.
Acquisition Date	(0008,0022)	-	3	The date the acquisition of data that resulted in this data set started.
Acquisition Time	(0008,0032)	-	3	The time the acquisition of data that resulted in this data set started.
Conversion Type	(0008,0064)	-	3	Describes the kind of image conversion. Defined Terms: DV = Digitized Video, DI = Digital Interface, DF = Digitized Film, WSD = Workstation.
Referenced Image Sequence	(0008,1140)	-	3	A sequence which provides reference to a set of Image SOP Class/Instance identifying other images significantly related to this data set. Encoded as sequence of items: (0008,1150) and (0008,1155).
Derivation Description	(0008,2111)	-	3	A text description of how this data set was derived.
Source Image Sequence	(0008,2112)	-	3	A Sequence which identifies the set of Image SOP Class/Instance pairs of the Images which were used to derive this data set. Zero or more Items may be included in this Sequence. Encoded as sequence of items: (0008,1150) and (0008,1155).
Patient Position	(0018,5100)	-	3	Patient position descriptor relative to the equipment.
Acquisition Number	(0020,0012)	-	3	A number identifying the single continuous gathering of data over a period of time which resulted in this data set.
Image Number	(0020,0013)	-	3	A number that identifies this data set.
Frame of Reference UID	(0020,0052)	-	3	Uniquely identifies the frame of reference for a Series.
Image Comments	(0020,4000)	-	3	User-defined comments about the image.

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Table 2: *CSA Non-Image Module*

Attribute Name	Tag	Owner	Type	Notes
Quality Control Image	(0028,0300)	-	3	Indicates whether or not this image is a quality control or phantom image. If this Attribute is absent, then the image may or may not be a quality control or phantom image. Enumerated Values: YES, NO.
Burned In Annotation	(0028,0301)	-	3	Indicates whether or not image contains sufficient burned in annotation to identify the patient and date the image was acquired. If this Attribute is absent, then the image may or may not contain burned in annotation. Enumerated Values: YES, NO.
Lossy Image Compression	(0028,2110)	-	3	Specifies whether an Image has undergone lossy compression. Enumerated Values: 00 = Image has NOT been subjected to lossy compression, 01 = Image has been subjected to lossy compression.
Lossy Image Compression Ratio	(0028,2112)	-	3	Describes the approximate lossy compression ratio(s) that have been applied to this image. May be multi valued if successive lossy compression steps have been applied.
CSA Data Type	(0029,xx08)	SIEMENS CSA NON-IMAGE	1	CSA Data identification characteristics. Defined Terms: BSR REPORT = Study Report Data RT3D CONFIG = InSpaceIS Data RT3D MASK = InSpaceIS Mask
CSA Data Version	(0029,xx09)	SIEMENS CSA NON-IMAGE	3	Version of CSA Data Info (0029,xx10) format and CSA Non-Image Data (7FE1,xx10) format.
CSA Data Info	(0029,xx10)	SIEMENS CSA NON-IMAGE	3	Information to describe the CSA Data (7FE1,xx10).
CSA Data	(7FE1,xx10)	SIEMENS CSA NON-IMAGE	2	Binary data as byte stream.

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A.2 Siemens Standard Extended Modules

Table 3: *CSA Image IOD Modules*

IE	Module	Reference	Usage	Note
Image	CSA Image Header	A.2.1	U	private GG information
	CSA Series Header	A.2.2	U	
	MEDCOM Header	A.2.3	U	private *syngo* information
	MEDCOM OOG	A.2.4	U	if object graphics is attached to image
	Angio Viewing	A.2.5	U	Store Monitor image Angio Viewer
	CT Extentions	A.2.6	U	Image Siemens CT application

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A.2.1 CSA Image Header Module

The table in this section contains private IOD Attributes that describe the CSA Image Header..

Table 4: *CSA Image Header Module*

Attribute Name	Tag	Owner	Type	Notes
CSA Image Header Type	(0029,xx08)	SIEMENS CSA HEADER	1	CSA Image Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4 SOM 5 = SOMARIS/5
CSA Image Header Version	(0029,xx09)	SIEMENS CSA HEADER	3	Version of CSA Image Header Info (0029,xx10) format.
CSA Image Header Info	(0029,xx10)	SIEMENS CSA HEADER	3	Manufacturer model dependent information.

A.2.2 CSA Series Header Module

The table in this section contains private IOD Attributes that describe the CSA Series Header..

Table 5: *CSA Series Header Module*

Attribute Name	Tag	Owner	Type	Notes
CSA Series Header Type	(0029,xx18)	SIEMENS CSA HEADER	1	CSA Series Header identification characteristics. Defined Terms: NUM 4 = NUMARIS/4
CSA Series Header Version	(0029,xx19)	SIEMENS CSA HEADER	3	Version of CSA Series Header Info (0029,xx20) format.

Table 5: *CSA Series Header Module*

Attribute Name	Tag	Owner	Type	Notes
CSA Series Header Info	(0029,xx20)	SIEMENS CSA HEADER	3	Manufacturer model dependent information.

A.2.3 MEDCOM Header Module

The table in this section contains private IOD Attributes that describe MEDCOM Header.

Table 6: *MEDCOM Header Module*

Attribute Name	Tag	Owner	Type	Notes
MedCom Header Type	(0029,xx08)	SIEMENS MEDCOM HEADER	1C	MedCom Header identification characteristics. Defined Terms: MEDCOM 1 Required if MedCom Header Info (0029,xx10) present.
MedCom Header Version	(0029,xx09)	SIEMENS MEDCOM HEADER	2C	Version of MedCom Header Info (0029,xx10) format. Required if MEDCOM Header Info (0029,xx10) present.
MedCom Header Info	(0029,xx10)	SIEMENS MEDCOM HEADER	3	Manufacturer model dependent information. The value of the attribute MedCom Header Info (0029,xx10) can be build up in each user defined format.
MedCom History Information	(0029,xx20)	SIEMENS MEDCOM HEADER	3	MedCom defined Patient Registration history information. See A.2.3.1.
PMTF Information 1	(0029,xx31)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 2	(0029,xx32)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 3	(0029,xx33)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 4	(0029,xx34)	SIEMENS MEDCOM HEADER	3	Transformation Information
PMTF Information 5	(0029,xx35)	SIEMENS MEDCOM HEADER	3	Transformation Information
Application Header Sequence	(0029,xx40)	SIEMENS MEDCOM HEADER	3	Sequence of Application Header items. Zero or more items are possible.
>Application Header Type	(0029,xx41)	SIEMENS MEDCOM HEADER	1C	Application Header identification characteristics. Required, if Sequence is sent.
>Application Header ID	(0029,xx42)	SIEMENS MEDCOM HEADER	3	Identification of an application header

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Table 6: *MEDCOM Header Module*

Attribute Name	Tag	Owner	Type	Notes
>Application Header Version	(0029,xx43)	SIEMENS MED-COM HEADER	3	Version of CSA Series Header Info (0029,xx44) format.
>Application Header Info	(0029,xx44)	SIEMENS MED-COM HEADER	3	Application dependent information.
Workflow Control Flags	(0029,xx50)	SIEMENS MED-COM HEADER	3	Eight free definable flags.
Archive Management Flag Keep Online	(0029,xx51)	SIEMENS MED-COM HEADER	3	Flag to control remote archive management system to keep the image always online (also when already archived). Enumerated Values: 00 = remote control not required 01 = keep image online
Archive Management Flag Do Not Archive	(0029,xx52)	SIEMENS MED-COM HEADER	3	Flag to control remote archive management system not to archive the related image. Enumerated Values: 00 = remote control not required 01 = don’t archive image
Image Location Status	(0029,xx53)	SIEMENS MED-COM HEADER	3	Image location status to control retrieving. Defined Terms: ONLINE = retrieving has to be done as usual, NEARLINE = move request to SCP and delay according to value of Estimated Retrieve Time (0029,xx54), OFFLINE = invoking a retrieve operation initiates an operator request, INVALID = invoking a retrieve operation would always result in an error.
Estimated Retrieve Time	(0029,xx54)	SIEMENS MED-COM HEADER	3	Estimated retrieve time in seconds. A value less then zero (< 0) indicates location is OFFLINE or INVALID.
Data Size of Retrieved Images	(0029,xx55)	SIEMENS MED-COM HEADER	3	Data size of images in MByte.

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A.2.3.1 MEDCOM History Information

The value of the attribute MEDCOM History Information (0029,xx20) is defined in the following way:

Table 7: *MEDCOM History Information*

Part	Name	Type	Bytes	Notes
header	Identifier	string	32	always "CSA HISTORY"
	Version	string	32	e.g. "V1.10"

Table 7: MEDCOM History Information

Part	Name	Type	Bytes	Notes
n items	Class Name	string	64	
	Modification String	string	1024	

A.2.4 MEDCOM OOG Module

The table in this section contains private IOD Attributes that describe MEDCOM Object Oriented Graphics (OOG). This module is used whenever object graphics is drawn on the image and need to be stored as graphic object properties. Given the condition that the module contents was not removed by other modalities, the graphic objects remain re-animatable if such an image was transferred and is then retrieved back.

Table 8: MEDCOM OOG Module

Attribute Name	Tag	Owner	Type	Notes
MedCom OOG Type	(0029,xx08)	SIEMENS MEDCOM OOG	1	MEDCOM Object Oriented Graphics (OOG) identification characteristics. Defined Terms: MEDCOM OOG 1 MEDCOM OOG 2
MedCom OOG Version	(0029,xx09)	SIEMENS MEDCOM OOG	3	Version of MEDCOM OOG Info (0029,xx10) format.
MedCom OOG Info	(0029,xx10)	SIEMENS MEDCOM OOG	3	MEDCOM Object Oriented Graphics (OOG) data.

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The graphics objects are also fully drawn in the Image Overlay Plane for compatibility with other products which do not support the MedCom OOG module. Any system not supporting the MedCom OOG module shall remove the OOG module and it's contents when modifying the image overlay plane content.

A.2.5 Angio Viewing Module

The table in this section contains private IOD Attributes that describe additional Attributes for advanced Angio Viewing features.

Table 9: Angio Viewing Module

Attribute Name	Tag	Owner	Type	Notes
Review Mode	[0019,xx00]	SIEMENS SMS-AX VIEW 1.0	3	Special Modes for Angio Review. Defined Terms are 1 = REV_MAXFILL, 2 = REV_LOOP, 3 = REV_SCROLL, 4 = REV_STEREO_LOOP

Table 9: *Angio Viewing Module*

Attribute Name	Tag	Owner	Type	Notes
Anatomical Background Percent	[0019,xx01]	SIEMENS SMS-AX VIEW 1.0	3	Percentage of Mix between Subtracted Image Result and Native Mask. Range is from 0 to 100.
Number of Phases	[0019,xx02]	SIEMENS SMS-AX VIEW 1.0	3	1-4 (1 or # of "Variable Frame Rate" acq phases)
Apply Anatomical Background	[0019,xx03]	SIEMENS SMS-AX VIEW 1.0	3	boolean
Pixel Shift Array	[0019,xx04]	SIEMENS SMS-AX VIEW 1.0	3	4 * Number of Frames (0028,0008)
Brightness	[0019,xx05]	SIEMENS SMS-AX VIEW 1.0	3	SUB windowing
Contrast	[0019,xx06]	SIEMENS SMS-AX VIEW 1.0	3	SUB windowing
Enabled Shutters	[0019,xx07]	SIEMENS SMS-AX VIEW 1.0	3	visualize Shutter
Native Edge Enhancement Percent Gain	[0019,xx08]	SIEMENS SMS-AX VIEW 1.0	3	Percent gain for native display of images.
Native Edge Enhancement LUT Index	[0019,xx09]	SIEMENS SMS-AX VIEW 1.0	3	
Native Edge Enhancement Kernel Size	[0019,xx0A]	SIEMENS SMS-AX VIEW 1.0	3	
Subtracted Edge Enhancement Percent Gain	[0019,xx0B]	SIEMENS SMS-AX VIEW 1.0	3	Percent gain for subtracted display of images.
Subtracted Edge Enhancement LUT Index	[0019,xx0C]	SIEMENS SMS-AX VIEW 1.0	3	
Subtracted Edge Enhancement Kernel Size	[0019,xx0D]	SIEMENS SMS-AX VIEW 1.0	3	
Fade Percent	[0019,xx0E]	SIEMENS SMS-AX VIEW 1.0	3	
Flipped before Laterality Applied	[0019,xx0F]	SIEMENS SMS-AX VIEW 1.0	3	
Apply Fade	[0019,xx10]	SIEMENS SMS-AX VIEW 1.0	3	

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A.2.6 CT Extentions Modules

Table 10: *CT Extention Modules*

Attribute Name	Tag	Owner	Type	Notes
Osteo offset	[0019,xx90]	SIEMENS CT VA0 COAD	3	Offset of the water equivalent material of the Siemens Osteo phantom to real water
Osteo Regression line Slope	[0019,xx92]	SIEMENS CT VA0 COAD	3	Slope of the regression line for the ESP (=European Spine Phantom) standardization
Osteo Regression Line Intercept	[0019,xx93]	SIEMENS CT VA0 COAD	3	Intercept of the regression line for the ESP (= European Spine Phantom) standardization
Osteo phantom Number	[0019,xx96]	SIEMENS CT VA0 COAD	3	Number of the Siemens Osteo phantom
Feed per Rotation	[0019,xxB0]	SIEMENS CT VA0 COAD	3	Som/4 style Feed per Rotation (Backwards Compatibility)
Pulmo Trigger Level	[0019,xxBD]	SIEMENS CT VA0 COAD	3	Spirometer trigger level used for the scan, given in percent of VC (= Vital Capacity) of the patient
Expiratoric Reserve Volume	[0019,xxBE]	SIEMENS CT VA0 COAD	3	ERV (= Exspiratoric Reserve Volume) achieved by the patient
Vital Capacity	[0019,xxBF]	SIEMENS CT VA0 COAD	3	VC (= Vital Capacity) achieved by the patient
Pulmo Water	[0019,xxC0]	SIEMENS CT VA0 COAD	3	Density of the water insert of the Siemens Pulmo phantom
Pulmo Air	[0019,xxC1]	SIEMENS CT VA0 COAD	3	Density of the air holes of the Siemens Pulmo phantom
Pulmo Date	[0019,xxC2]	SIEMENS CT VA0 COAD	3	Date of the evaluation of the Siemens Pulmo phantom
Pulmo Time	[0019,xxC3]	SIEMENS CT VA0 COAD	3	Time of the evaluation of the Siemens Pulmo phantom
Target	[0021,xx11]	SIEMENS MED	3	Som/4 style Target (Backwards Compatibility)
Private Creator	[0009,00xx]	SIEMENS CT VA1 DUMMY	1	

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A.3 Registry of DICOM Data Elements

Tag	Private Owner Code	Name	VR	VM
(0019,xx00)	SIEMENS SMS-AX VIEW 1.0	Review Mode	US	1
(0019,xx01)	SIEMENS SMS-AX VIEW 1.0	Anatomical Background Percent	US	1
(0019,xx02)	SIEMENS SMS-AX VIEW 1.0	Number of Phases	US	1
(0019,xx03)	SIEMENS SMS-AX VIEW 1.0	Apply Anatomical Background	US	1
(0019,xx04)	SIEMENS SMS-AX VIEW 1.0	Pixelshift Array	SS	4-4n
(0019,xx05)	SIEMENS SMS-AX VIEW 1.0	Brightness	US	1
(0019,xx06)	SIEMENS SMS-AX VIEW 1.0	Contrast	US	1
(0019,xx07)	SIEMENS SMS-AX VIEW 1.0	Enabled Shutters	US	1
(0019,xx08)	SIEMENS SMS-AX VIEW 1.0	Native Edge Enh. Percent Gain	US	1
(0019,xx09)	SIEMENS SMS-AX VIEW 1.0	Native Edge Enh. LUT Index	SS	1
(0019,xx0A)	SIEMENS SMS-AX VIEW 1.0	Native Edge Enh. Kernel Size	SS	1
(0019,xx0B)	SIEMENS SMS-AX VIEW 1.0	Subtr. Edge Enh. Percent Gain	US	1
(0019,xx0C)	SIEMENS SMS-AX VIEW 1.0	Subtr. Edge Enh. LUT Index	SS	1
(0019,xx0D)	SIEMENS SMS-AX VIEW 1.0	Subtr. Edge Enh. Kernel Size	SS	1
(0019,xx0E)	SIEMENS SMS-AX VIEW 1.0	Fade Percent	US	1
(0019,xx0F)	SIEMENS SMS-AX VIEW 1.0	Flipped Befor Laterality Applied	US	1
(0019,xx10)	SIEMENS SMS-AX VIEW 1.0	Apply Fade	DS	1
(0019,xx90)	SIEMENS CT VA0 COAD	Osteo Offset	DS	1
(0019,xx92)	SIEMENS CT VA0 COAD	Osteo Regression Slope Intercept	DS	1
(0019,xx93)	SIEMENS CT VA0 COAD	Osteo Regression Line Intercept	DS	1
(0019,xx96)	SIEMENS CT VA0 COAD	Osteo Phantom Number	IS	1
(0019,xxB0)	SIEMENS CT VA0 COAD	Feed per Rotation	DS	1
(0019,xxBD)	SIEMENS CT VA0 COAD	Pulmo Trigger Level	IS	1
(0019,xxBE)	SIEMENS CT VA0 COAD	Expiratoric Reserve Volume	DS	1
(0019,xxBF)	SIEMENS CT VA0 COAD	Vital Capacity	DS	1
(0019,xxC0)	SIEMENS CT VA0 COAD	Pulmo Water	DS	1
(0019,xxC1)	SIEMENS CT VA0 COAD	Pulmo Air	DS	1
(0019,xxC2)	SIEMENS CT VA0 COAD	Pulmo Date	DA	1
(0019,xxC3)	SIEMENS CT VA0 COAD	Pulmo Time	TM	1
(0021,xx11)	SIEMENS MED	Target	DS	2
(0029,xx08)	SIEMENS CSA NON-IMAGE	CSA Data Type	CS	1
(0029,xx09)	SIEMENS CSA NON-IMAGE	CSA Data Version	LO	1
(0029,xx10)	SIEMENS CSA NON-IMAGE	CSA Data Info	OB	1
(0029,xx08)	SIEMENS CSA HEADER	CSA Image Header Type	CS	1
(0029,xx09)	SIEMENS CSA HEADER	CSA Image Header Version	LO	1
(0029,xx10)	SIEMENS CSA HEADER	CSA Image Header Info	OB	1
(0029,xx18)	SIEMENS CSA HEADER	CSA Series Header Type	CS	1
(0029,xx19)	SIEMENS CSA HEADER	CSA Series Header Version	LO	1

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(0029,xx20)	SIEMENS CSA HEADER	CSA Series Header Info	OB	1
(0029,xx08)	SIEMENS MEDCOM HEADER	MedCom Header Type	CS	1
(0029,xx09)	SIEMENS MEDCOM HEADER	MedCom Header Version	LO	1
(0029,xx10)	SIEMENS MEDCOM HEADER	MedCom Header Info	OB	1
(0029,xx20)	SIEMENS MEDCOM HEADER	MedCom History Information	OB	1
(0029,xx31)	SIEMENS MEDCOM HEADER	PMTF Information 1	LO	1
(0029,xx32)	SIEMENS MEDCOM HEADER	PMTF Information 2	UL	1
(0029,xx33)	SIEMENS MEDCOM HEADER	PMTF Information 3	UL	1
(0029,xx34)	SIEMENS MEDCOM HEADER	PMTF Information 4	CS	1
(0029,xx35)	SIEMENS MEDCOM HEADER	PMTF Information 5	UL	1
(0029,xx40)	SIEMENS MEDCOM HEADER	Application Header Sequence	SQ	1
(0029,xx41)	SIEMENS MEDCOM HEADER	Application Header Type	CS	1
(0029,xx42)	SIEMENS MEDCOM HEADER	Application Header ID	LO	1
(0029,xx43)	SIEMENS MEDCOM HEADER	Application Header Version	LO	1
(0029,xx44)	SIEMENS MEDCOM HEADER	Application Header Info	OB	1
(0029,xx50)	SIEMENS MEDCOM HEADER	Workflow Control Flags	LO	8
(0029,xx51)	SIEMENS MEDCOM HEADER	Arch. Mgmnt Flag Keep Online	CS	1
(0029,xx52)	SIEMENS MEDCOM HEADER	Arch. Mgmnt Flag Do not Archive	CS	1
(0029,xx53)	SIEMENS MEDCOM HEADER	Image Location Status	CS	1
(0029,xx54)	SIEMENS MEDCOM HEADER	Estimated Retrieve Time	DS	1
(0029,xx55)	SIEMENS MEDCOM HEADER	Data Size of Retrieved Images	DS	1
(0029,xx08)	SIEMENS MEDCOM OOG	MEDCOM OOG Type	CS	1
(0029,xx09)	SIEMENS MEDCOM OOG	MEDCOM OOG Version	LO	1
(0029,xx10)	SIEMENS MEDCOM OOG	MEDCOM OOG Info	OB	1
(7FE1,xx10)	SIEMENS CSA NON-IMAGE	CSA Data	OB	1

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Note

Please be informed that some of the Private Owner Codes contain double-spaces in the name definitions. The following terms (only double-spaces marked) are defined:

SIEMENS SMS-AX<spc><spc>VIEW 1.0

All spaces not specially marked, are single spaces.

A.4 Standard Extentions of all SOP Classes

The following tables list the data dictionary of all DICOM IOD attributes where the DICOM standard definitions are extended:.

Table 11: *Standard Extensions of all SOP Classes*

Attribute Name	Tag	Private Creator	Type	Notes
Image Type	(0008,0008)	-	1	See A.4.1 for further explanation. additional Defined Terms: Defined Terms for value 3: OTHER MPR PROJECTION IMAGE UNDEFINED Defined Terms for value 4: CSA *[a] CT_SOM4 * CT_SOM5 *[b] CT_SOM6 * SHS * Somaris/5 based SOMATOM products provide a value 5 with the Defined Terms: ADD CTL FINISHED IN_WORK MRTD OTOM OTOP PBF PBV PKET PMON TTP TTS
Patient Position	(0018,5100)	-	2C	Additional Defined Terms for the Magnetom Open HLS HLP FLS FLP HLDL HLDR FLDL FLDR

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Table 11: *Standard Extensions of all SOP Classes*

Attribute Name	Tag	Private Creator	Type	Notes
Body Part Examined	(0018,0015)		3	Additional Defined Terms for the Somaris/5 based SOMATOM products: SPINE SPECIAL UNKNOWN SERVICE See A.7 for further explanation.

a. For terms beginning with the stated prefix, e. g. "CSA", and ending with a "*" , see A.4.1.

b. For private extensions see A.2 ff.

All SOP classes may contain additional type 3 attributes which DICOM standard defines in a different DICOM IOD or DICOM SOP class (attributes from Normalized SOP classes).

This is the case for example for

- Rescale Slope (0028,1053)
- Rescale Intercept (0028,1052)

which are also used in the MR IOD.

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A.4.1 Image Type

The Image Type (0008,0008) attribute identifies important image identification characteristics. These characteristics are:

1. Pixel Data Characteristics:
   - is the image an ORIGINAL Image; an image whose pixel values are based on original or source data, or
   - is the image a DERIVED Image; an image whose pixel values have been derived in some manner from the pixel value of one or more other images.
2. Patient Examination Characteristics:
   - is the image a PRIMARY Image; an image created as a direct result of the Patient examination, or
   - is the image a SECONDARY Image; an image created after the initial Patient examination.
3. Modality Specific Characteristics (SOP Specific Characteristics).
4. Implementation specific identifiers; other implementation specific identifiers shall be documented in an implementation's conformance claim.

The Image Type attribute is multi-valued and shall be provided in the following manner:

- **Value 1** shall identify the Pixel Data Characteristics; Enumerated Values for the Pixel Data Characteristics are:

- ORIGINAL = identifies an Original Image
- DERIVED = identifies a Derived Image

- **Value 2** shall identify the Patient Examination Characteristics; Enumerated Values for the Patient Examination Characteristics are:
  - PRIMARY = identifies a Primary Image
  - SECONDARY = identifies a Secondary Image
- **Value 3** shall identify any Image IOD specific specialization, the following terms are defined in addition to the DICOM standard definitions:
  - OTHER = converted non-Axial and non-Localizer CT images; images of no special type (new syntax)
  - MPR = 3D MPR images (MR)
  - PROJECTION IMAGE = 3D MIP and SSD images (MR)
  - UNDEFINED = images of no special type (old syntax)
- **Value 4** is implementation specific. The following terms are defined:
  - original *syngo* generated data set types:

    CSA 3D EDITOR = object created by 3D Editor

    CSA 3D FLY PATH = object created by Fly Through Path

    CSA 3D FLY VRT = object created by Fly Through Volume Rendering Technique

    CSA 3D FUSION = object created by Fusion

    CSA AVERAGE = image was created by Average

    CSA BLACK IMAGE = SC Image with black pixels, only graphics information is of interest

    CSA RESAMPLED = derived image created by zooming or panning original image

    CSA MIP = image created by Maximum Intensity Projection

    CSA MIP THIN = image created by Maximum Intensity Projection

    CSA MPR = image created by Multi Planar Reconstruction

    CSA MPR CURVED = image created by Multi Planar Reconstruction

    CSA MPR THICK = image created by Multi Planar Reconstruction

    CSA MPR THIN = image created by Multi Planar Reconstruction

    CSA SSD = SC Image as Shaded Surface Display

    CSA SUBTRACT = image was created by Subtraction

    ECAT ACF = CTI PET Attenuation Correction

    ECAT NORMAL = CTI PET Normalization

    ECAT 3D SINO = CTI PET 3D Sinogram Short

    ECAT 3D SINO FLT = CTI PET 3D Sinogram Float
  - additional image types generated by Somaris/5 based SOMATOM products

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CT_SOM5 AVE = Averaged Image

CT_SOM5 ICD = Interventional Cine Display Image

CT_SOM5 MON = Monitoring or Premonitoring Image

CT_SOM5 MUL = Multiscan Image

CT_SOM5 PAR = Parameter Image

CT_SOM5 PROT = Protocol Image

CT_SOM5 ROT = ROT Image

CT_SOM5 RTD = Real Time Display Image

CT_SOM5 SEQ = Sequence Image

CT_SOM5 SPI = Spiral Image

CT_SOM5 STA = Static Image

CT_SOM5 SUB = Subtracted Image

CT_SOM5 TOP = Topogram

CT_SOM5 DPAN = Dental Panorama Rebuilt Tomogram

CT_SOM5 DPAR = Dental Paraxial Rebuilt Tomogram

CT_SOM5 DFLM = Dental Filming Image

CT_SOM5 DYB = Dynamic Evaluation Averaged Baseline Image

CT_SOM5 DYF = Dynamic Evaluation Fused Multislice Image

CT_SOM5 PEVI = Pulmo Evaluation Image

CT_SOM5 OEVA = Osteo Evaluated Tomogram

CT_SOM5 MIP = Maximum Intensity Projection image created by a CT application

CT_SOM5 MPR = Multi Planar Reconstruction image created by a CT application

CT_SOM5 REP = Lung Care Report Image

- converted images

  CT_SOM4 NONE = converted SOMARIS image

  CT_SOM4 CONV = converted SOMARIS Convolution Kernel file

  CT_SOM4 DART = converted SOMARIS Dental Artificial image

  CT_SOM4 DEVA = converted SOMARIS Dental Evaluation image

  CT_SOM4 DGRA = converted SOMARIS Dental Graphics image

  CT_SOM4 DMEA = converted SOMARIS Dynamic Measurement image

  CT_SOM4 DPAN = converted SOMARIS Dental Panorama image

  CT_SOM4 DPAR = converted SOMARIS Dental Paraxial image

  CT_SOM4 EBT = converted SOMARIS Evolution image

  CT_SOM4 HIS = converted SOMARIS Histogram Graphics image

  CT_SOM4 HISC = converted SOMARIS Histogram Graphics image

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CT_SOM4 MUL = converted SOMARIS Multiscan image
CT_SOM4 OEVA = converted SOMARIS Osteo Evaluation image
CT_SOM4 OTOM = converted SOMARIS Osteo Tomogram image
CT_SOM4 OTOP = converted SOMARIS Osteo Topogram image
CT_SOM4 PLOT = converted SOMARIS Plot image
CT_SOM4 QUAL = converted SOMARIS Quality image
CT_SOM4 R2D = converted SOMARIS 2D Rebuild image
CT_SOM4 R3D = converted SOMARIS 3D Rebuild image
CT_SOM4 R3DE = converted SOMARIS 3D Rebuild image
CT_SOM4 RMAX = converted SOMARIS Maximum Intensity Projection image
CT_SOM4 RMIN = converted SOMARIS Minimum Intensity Projection image
CT_SOM4 ROT = converted SOMARIS Rotation Mode image
CT_SOM4 RRAD = converted SOMARIS Radiographic Projection image
CT_SOM4 RVIT = converted SOMARIS Vessel Image Tool image
CT_SOM4 RVRT = converted SOMARIS Volumetric Rendering image
CT_SOM4 SAVE = converted SOMARIS Evolution Screen Save image
CT_SOM4 SCAN = converted SOMARIS Standard Mode image
CT_SOM4 SEQ = converted SOMARIS Sequence Mode image
CT_SOM4 SER = converted SOMARIS Serial Mode image
CT_SOM4 SIN = converted SOMARIS Sinogram image
CT_SOM4 SINC = converted SOMARIS Sinogram image
CT_SOM4 SPI = converted SOMARIS Spiral Mode image
CT_SOM4 STA = converted SOMARIS Static Mode image
CT_SOM4 TAB = converted SOMARIS Correction Table image
CT_SOM4 TOP = converted SOMARIS Topogram image
CT_SOM4 GTOP = converted SOMARIS Topo Graphics image
CT_SOM4 PEVG = converted SOMARIS Pulmo Evaluation image
CT_SOM4 PEVI = converted SOMARIS Pulmo Evaluation image
CT_SOM4 PUL = converted SOMARIS Pulmo Respiration curve
CT_SOM4 PROT = converted SOMARIS Protocol image
CT_SOM4 TEXT = converted SOMARIS Text image
CT_SOM4 ICD = converted SOMARIS Interventional Cine image

SHS DENT = converted MagicView Dental Tomogram image
SHS DPAN = converted MagicView Dental Panorama image

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SHS DPAR = converted MagicView Dental Paraxial image

SHS 3D_CURVED = converted MagicView image

SHS 3D_MIP = converted MagicView Maximum Intensity Projection image

SHS 3D_MPR = converted MagicView Multi Planar Reconstruction image

SHS 3D_SSD = converted MagicView Shaded Surface Display image

SHS 3D_VRT = converted MagicView Volumetric Rendering image

- **Value 5** is specific for the Somaris/5 based SOMATOM products. The following terms are defined:
  - ADD = Additional Scan
  - CTL = Control Scan
  - FINISHED = Lung Care Report Image (finished)
  - IN_WORK = Lung Care Report Image (not finished)
  - MRTD = Multiscan Real Time Display Image
  - OTOM = Osteo Scanned Tomogram
  - OTOP = Osteo Scanned Topogram
  - PBF = Perfusion Blood Flow Image
  - PBV = Perfusion Blood Volume Image
  - PKET = Peak Enhancement Parameter Image
  - PMON = Premonitoring Scan
  - TTP = Time to Peak Parameter Image
  - TTS = Time to Start Parameter Image

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A.5 SC Standard Extended SOP Class

The Med-Workstation will create functional images from special applications. Those will be encoded as SC Standard extended SOP Class. Please see the following tables for complete overview of supplied Type 1/2/3 Standard and Private attributes:

A.5.1 DR-Composing result image

Table 12: *overview of supplied attributes - SC derived image (Monochrome) from Composing*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	(conf. Character Set is added, if needed)

Table 12: *overview of supplied attributes - SC derived image (Monochrome) from Composing*

Attribute Name	Tag	Value
Image Type	[0008,0008]	DERIVED\SECONDARY\\<algorithm>\<SW version> <algorithm> = SPINE or COLON or LLEG_ORTHO or LLEG_ANGIO or SPINE DLR or COLON DLR or LLEG_ORTHO DLR or LLEG_ANGIO DLR
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	[0008,0018]	
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	<yyyymmdd>
Acquisition Date	[0008,0022]	derived from original Acquisiton / Image Date or zero length
Image Date	[0008,0023]	<yyyymmdd>
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	<hhmmss>
Acquisition Time	[0008,0032]	derived from original Acquisiton / Image Time or zero length
Image Time	[0008,0033]	<hhmmss>
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	OT
Conversion Type	[0008,0064]	WSD
Manufacturer	[0008,0070]	Siemens
Institution Name	[0008,0080]	from WS configuration
Institution Address	[0008,0081]	from WS configuration
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	from WS configuration
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	(see [0008,0008] 3rd value <algorithm>)
Performing Physicians´ Name	[0008,1050]	input via "Correct" user interface possible
Manufacturer´s Model Name	[0008,1090]	LEONARDO
Derivation Description	[0008,2111]	<algorithm> (see [0008,0008])
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original

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Table 12: overview of supplied attributes - SC derived image (Monochrome) from Composing

Attribute Name	Tag	Value
Device Serial Number	[0018,1000]	from WS configuration
Secondary Capture Device ID	[0018,1010]	from WS configuration
Date of Secondary Capture	[0018,1012]	<yyyymmdd>
Time of Secondary Capture	[0018,1014]	<hhmmss>
Secondary Capture Device Manufacturer	[0018,1016]	Siemens
Secondary Capture Device Manufacturer´s Model Name	[0018,1018]	LEONARDO
Secondary Capture Device Software Version	[0018,1019]	from WS configuration
Software Versions	[0018,1020]	from WS configuration
Protocol Name	[0018,1030]	same as Series Description
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	
Image Number	[0020,0013]	
Patient Orientation	[0020,0020]	zero length
Laterality	[0020,0060]	removed (zero length)
Image Comments	[0020,4000]	
Samples Per Pixel	[0028,0002]	1
Photometric Interpretation	[0028,0004]	MONOCHROME1 or MONOCHROME2
Rows	[0028,0010]	(defined by the number of original images used and the overlap by reconstruction algorithm)
Columns	[0028,0011]	from Originals
Bits Allocated	[0028,0100]	from Originals
Bits Stored	[0028,0101]	from Originals
High Bit	[0028,0102]	from Originals
Pixel Representation	[0028,0103]	0
Window Center	[0028,1050]	
Window Width	[0028,1051]	
Window Center & Width Explanation	[0028,1055]	
Study Comments	[0032,4000]	from Originals
Overlay Rows	[60xx,0010]	
Overlay Columns	[60xx,0011]	

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Table 12: *overview of supplied attributes - SC derived image (Monochrome) from Composing*

Attribute Name	Tag	Value
Overlay Description	[60xx,0022]	
Overlay Type	[60xx,0040]	G
Origin	[60xx,0050]	1\1
Overlay Bits Allocated	[60xx,0100]	Same as [0028,0100] or 1 (if Overlay encoded in [60xx,3000])
Bit Position	[60xx,0102]	12 or 0 (if Overlay encoded in [60xx,3000])
Overlay Data	[60xx,3000]	(with Offline Media Instances) Graphics Overlay
Pixel Data	[7FE0,0010]	

A.5.2 EndoMap result image

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Table 13: *overview of supplied attributes - SC derived image (RGB) from EndoMap*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	from Original
Image Type	[0008,0008]	DERIVED\SECONDARY\\DRAWING\<SW version>
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	[0008,0018]	1.3.12.2.1107.5.4.10.serialnumber.<individual_uid>
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	<yyyymmdd>
Acquisition Date	[0008,0022]	from Original
Image Date	[0008,0023]	<yyyymmdd>
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	<hhmmss>
Acquisition Time	[0008,0032]	from Original
Image Time	[0008,0033]	<hhmmss>
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	OT
Conversion Type	[0008,0064]	WSD
Manufacturer	[0008,0070]	Hectec GmbH
Institution Name	[0008,0080]	from WS configuration
Institution Address	[0008,0081]	from WS configuration

Table 13: *overview of supplied attributes - SC derived image (RGB) from EndoMap*

Attribute Name	Tag	Value
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	from WS configuration
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	"EndoMap Planung" + orig. content
Performing Physicians´ Name	[0008,1050]	input via "Correct" or "EndoMap" user interface possible
Manufacturer´s Model Name	[0008,1090]	LEONARDO
Derivation Description	[0008,2111]	e.g. "EndoMap Version V2.00 Planung" and more..
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Device Serial Number	[0018,1000]	from WS configuration
Secondary Capture Device ID	[0018,1010]	from WS configuration
Date of Secondary Capture	[0018,1012]	<yyyymmdd>
Time of Secondary Capture	[0018,1014]	<hhmmss>
Secondary Capture Device Manufacturer	[0018,1016]	Hectec GmbH
Secondary Capture Device Manufacturer´s Model Name	[0018,1018]	LEONARDO
Secondary Capture Device Software Version	[0018,1019]	EndoMap <SW-Version>
Software Versions	[0018,1020]	from WS configuration
Protocol Name	[0018,1030]	same as Series Description
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	1.3.12.2.1107.5.4.10.serialnum-ber.<individual_uid>
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	from Original
Image Number	[0020,0013]	from Original
Patient Orientation	[0020,0020]	zero length
Laterality	[0020,0060]	removed (zero length)
Image Comments	[0020,4000]	application information, pre-canned texts
Samples Per Pixel	[0028,0002]	3 (RGB) or 1 (MONOCHROME2)
Photometric Interpretation	[0028,0004]	RGB or MONOCHROME2
Planar Configuration	[0028,0006]	0 (RGB only)

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Table 13: *overview of supplied attributes - SC derived image (RGB) from EndoMap*

Attribute Name	Tag	Value
Rows	[0028,0010]	Number of pixel rows based on calculated resolution
Columns	[0028,0011]	Number of pixel columns based on calculated resolution
Bits Allocated	[0028,0100]	8 (RGB or MONOCHROME2)
Bits Stored	[0028,0101]	8 (RGB or MONOCHROME2)
High Bit	[0028,0102]	7 (RGB or MONOCHROME2)
Pixel Representation	[0028,0103]	0
Pixel Data	[7FE0,0010]	

A.5.3 IIDC images (input/results)

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Table 14: *overview of supplied attributes - SC derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	from Original
Image Type	[0008,0008]	from Original or DERIVED\SECONDARY\<values from original>\PHANTOM\<SW version> or DERIVED\SECONDARY\<values from original>\CORRECTED\<SW version>
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	[0008,0018]	
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	if 'new series': <yyyymmdd> if 'append series': from Original
Acquisition Date	[0008,0022]	from Original
Image Date	[0008,0023]	<yyyymmdd>
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	if 'new series': <hhmmss> if 'append series': from Original
Acquisition Time	[0008,0032]	from Original
Image Time	[0008,0033]	<hhmmss>
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	from Original
Conversion Type	[0008,0064]	from Original

Table 14: *overview of supplied attributes - SC derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Manufacturer	[0008,0070]	from Original
Institution Name	[0008,0080]	from Original
Institution Address	[0008,0081]	from Original
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	if ’new series’: from WS configuration if ’append series’: from Original
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	if ’new series’: from "Save as" dialog if ’append series’: from Original
Institutional Department Name	[0008,1040]	if ’new series’: from WS configuration if ’append series’: from Original
Performing Physicians´ Name	[0008,1050]	input via "Correct" or from Original
Admitting Diagnosis Description	[0008,1060]	from Original
Manufacturer´s Model Name	[0008,1090]	from Original
Derivation Description	[0008,2111]	<pre-canned texts>
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Patient´s Age	[0010,1010]	from Original
Patient´s Size	[0010,1020]	from Original
Patient´s Weight	[0010,1030]	from Original
Patient´s Address	[0010,1040]	from Original
Patient´s Comments	[0010,4000]	from Original
KVP	[0018,0060]	from Original
Device Serial Number	[0018,1000]	from Original
Secondary Capture Device ID	[0018,1010]	from Original
Date of Secondary Capture	[0018,1012]	from Original
Time of Secondary Capture	[0018,1014]	from Original
Secondary Capture Device Manufacturer	[0018,1016]	from Original
Secondary Capture Device Manufacturer´s Model Name	[0018,1018]	from Original
Secondary Capture Device Software Version	[0018,1019]	from Original
Software Versions	[0018,1020]	from Original

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Table 14: *overview of supplied attributes - SC derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Protocol Name	[0018,1030]	from Original
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	if 'new series': <new UID> if 'append series': from Original
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	if 'new series': <highest series number+1> if 'append series': from Original
Image Number	[0020,0013]	if 'new series': 1 if 'append series': <highest image number+1>
Patient Orientation	[0020,0020]	zero length (forced)
Laterality	[0020,0060]	from Original
Image Comments	[0020,4000]	from Original or "Used for Measurement" or "Corrected Image"
Samples Per Pixel	[0028,0002]	1
Photometric Interpretation	[0028,0004]	MONOCHROME1 or MONOCHROME2
Rows	[0028,0010]	from Original
Columns	[0028,0011]	from Original
Bits Allocated	[0028,0100]	from Original
Bits Stored	[0028,0101]	from Original
High Bit	[0028,0102]	from Original
Pixel Representation	[0028,0103]	from Original
Window Center	[0028,1050]	from Original
Window Width	[0028,1051]	from Original
Window Center & Width Explanation	[0028,1055]	from Original
Study Comments	[0032,4000]	from Original
Request Attributes Sequence	[0040,0275]	from Original
>Attributes of 'Request Attributes Sequence'		
Overlay Rows	[60xx,0010]	Only if corrected / superimposed crosshairs: same as [0028,0010]
Overlay Columns	[60xx,0011]	Only if corrected / superimposed crosshairs: same as [0028,0011]
Overlay Description	[60xx,0022]	Only if corrected / superimposed crosshairs: <pre-canned description>
Overlay Type	[60xx,0040]	Only if corrected / superimposed crosshairs: G

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Table 14: overview of supplied attributes - SC derived image (Monochrome) from IIDC

Attribute Name	Tag	Value
Origin	[60xx,0050]	Only if corrected / superimposed crosshairs: 1\1
Overlay Bits Allocated	[60xx,0100]	Only if corrected / superimposed crosshairs: Same as [0028,0100] or 1 (if Overlay encoded in [60xx,3000])
Bit Position	[60xx,0102]	Only if corrected / superimposed crosshairs: 12 or 0 (if Overlay encoded in [60xx,3000])
Overlay Data	[60xx,3000]	Only if corrected / superimposed crosshairs: (with Offline Media Instances) Graphics Overlay
Pixel Data	[7FE0,0010]	

A.5.4 InSpaceIS projection image results

Table 15: overview of supplied attributes - SC derived image (RGB) from InSpaceIS

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	from Original
Image Type	[0008,0008]	DERIVED\SECONDARY\OTHER\CSA 3D
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	[0008,0018]	
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	<yyyymmdd>
Image Date	[0008,0023]	<yyyymmdd>
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	<hhmmss>
Image Time	[0008,0033]	<hhmmss>
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	CT
Conversion Type	[0008,0064]	WSD
Manufacturer	[0008,0070]	"HipGraphics"
Institution Name	[0008,0080]	from WS configuration
Institution Address	[0008,0081]	from WS configuration
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	from WS configuration
Study Description	[0008,1030]	from Original

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Table 15: *overview of supplied attributes - SC derived image (RGB) from InSpaceIS*

Attribute Name	Tag	Value
Series Description	[0008,103E]	
Performing Physicians´ Name	[0008,1050]	input via "Correct"
Manufacturer´s Model Name	[0008,1090]	"InSpace Postprocessing"
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Patient´s Age	[0010,1010]	from Original
Device Serial Number	[0018,1000]	from WS configuration
Secondary Capture Device ID	[0018,1010]	from WS configuration
Date of Secondary Capture	[0018,1012]	<yyyymmdd>
Time of Secondary Capture	[0018,1014]	<hhmmss>
Secondary Capture Device Manufacturer	[0018,1016]	"HipGraphics"
Secondary Capture Device Manufacturer´s Model Name	[0018,1018]	"InSpace Postprocessing"
Secondary Capture Device Software Version	[0018,1019]	
Software Versions	[0018,1020]	from WS configuration
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	from Original
Image Number	[0020,0013]	from Original
Patient Orientation	[0020,0020]	
Samples Per Pixel	[0028,0002]	3
Photometric Interpretation	[0028,0004]	RGB
Planar Configuration	[0028,0006]	0
Rows	[0028,0010]	
Columns	[0028,0011]	
Bits Allocated	[0028,0100]	8
Bits Stored	[0028,0101]	8
High Bit	[0028,0102]	7
Pixel Representation	[0028,0103]	0
Pixel Data	[7FE0,0010]	

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A.6 XA Standard Extended SOP Class

The LEONARDO Workstation will create “screen-shots” (Store Monitor images) from the Angio Viewer application (XA/XRF IOD) or corrected images from IIDC algorithm. Those will be encoded as XA Standard extended SOP Class. The InSpaceIS reconstruction package allows to store copies of the corrected input images. The Angio Viewer creates XRF images, if this IOD Class is base for viewing. Please see the following table for complete overview of supplied Type 1/2/3 Standard and Private attributes:

A.6.1 Angio Viewer "Store Monitor" image

Table 16: *overview of supplied attributes - XA/XRF derived image (Monochrome) Store Monitor*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	(conf. Character Set is added, if needed)
Image Type	[0008,0008]	DERIVED\SECONDARY\SINGLE PLANE\SINGLE A(B)\STORE MONITOR
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.12.1 or 1.2.840.10008.5.1.4.1.1.12.2
SOP Instance UID	[0008,0018]	
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	from Original
Acquisition Date	[0008,0022]	Derived from original Acquisition/Image Date or zero length
Image Date	[0008,0023]	<yyyymmdd> (Date of Creation)
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	from Original
Acquisition Time	[0008,0032]	Derived from original Acquisition/Image Time or zero length
Image Time	[0008,0033]	<hhmmss> (Time of Creation)
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	XA
Manufacturer	[0008,0070]	Siemens
Institution Name	[0008,0080]	from Original
Institution Address	[0008,0081]	from Original
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	from Original

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Table 16: *overview of supplied attributes - XA/XRF derived image (Monochrome) Store Monitor*

Attribute Name	Tag	Value
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	from Original
Institutional Department Name	[0008,1040]	from Original
Performing Physicians´ Name	[0008,1050]	input via “Correct” user interface possible
Operator´s Name	[0008,1070]	from Original
Admitting Diagnoses Description	[0008,1080]	from Original
Manufacturer´s Model Name	[0008,1090]	from Original
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Patient´s Age	[0010,1010]	from Original
Patient´s Size	[0010,1020]	from Original
Patient‘s Weight	[0010,1030]	from Original
Patient Comments	[0010,4000]	from Original
Contrast/Bolus Agent	[0018,0010]	from Original
KVP	[0018,0060]	from Original
Device Serial Number	[0018,1000]	from Original
Software Versions	[0018,1020]	from Original
Protocol Name	[0018,1030]	from Original
Contrast/Bolus Ingredient	[0018,1048]	from Original
Distance Source to Detector	[0018,1110]	from Original
Distance Source to Patient	[0018,1111]	from Original
Estimated Radiographic Magnification Factor	[0018,1114]	from Original
Exposure Time	[0018,1150]	from Original
X-Ray Tube Current	[0018,1151]	from Original
Average Pulse Width	[0018,1154]	from Original
Radiation Setting	[0018,1155]	from Original
Radiation Mode	[0018,115A]	from Original
Image Area Dose Product	[0018,115E]	from Original
Intensifier Size	[0018,1162]	from Original
Imager Pixel Spacing	[0018,1164]	from Original
Grid	[0018,1166]	from Original

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Table 16: *overview of supplied attributes - XA/XRF derived image (Monochrome) Store Monitor*

Attribute Name	Tag	Value
Column Angulation	[0018,1450]	from Original (XRF image only)
Tomo Layer Height	[0018,1460]	from Original (XRF image only)
Tomo Angle	[0018,1470]	from Original (XRF image only)
Tomo Time	[0018,1480]	from Original (XRF image only)
Positioner Motion	[0018,1500]	from Original
Positioner Primary Angle	[0018,1510]	from Original
Positioner Secondary Angle	[0018,1511]	from Original
Detector Primary Angle	[0018,1530]	from Original
Detector Secondary Angle	[0018,1531]	from Original
Shutter Shape	[0018,1600]	
Shutter Left Vertical Edge	[0018,1602]	as set
Shutter Right Vertical Edge	[0018,1604]	as set
Shutter Upper Horizontal Edge	[0018,1606]	as set
Shutter Lower Horizontal Edge	[0018,1608]	as set
Center of Circular Shutter	[0018,1610]	from Original
Radius of Circular Shutter	[0018,1612]	from Original
Collimator Shape	[0018,1700]	from Original
Collimator Left Vertical Edge	[0018,1702]	from Original
Collimator Right Vertical Edge	[0018,1704]	from Original
Collimator Upper Horizontal Edge	[0018,1706]	from Original
Collimator Lower Horizontal Edge	[0018,1708]	from Original
Center of Circular Collimator	[0018,1710]	from Original
Radius of Circular Collimator	[0018,1712]	from Original
Vertices of the Polygonal Collimator	[0018,1720]	from Original
Private Creator	[0019,00xx]	SIEMENS SMS-AX VIEW 1.0
Review Mode	[0019,xx00]	if existent in Original (Siemens AXIOM system)
Anatomical Background Percent	[0019,xx01]	as set
Number of Phases	[0019,xx02]	if existent in Original (Siemens AXIOM system)
Apply Anatomical Background	[0019,xx03]	as set
Pixel Shift Array	[0019,xx04]	as set
Brightness	[0019,xx05]	as set
Contrast	[0019,xx06]	as set
Enabled Shutters	[0019,xx07]	as set

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Table 16: *overview of supplied attributes - XA/XRF derived image (Monochrome) Store Monitor*

Attribute Name	Tag	Value
Native Edge Enhancement Percent Gain	[0019,xx08]	as set
Native Edge Enhancement LUT Index	[0019,xx09]	as set
Native Edge Enhancement Kernel Size	[0019,xx0A]	as set
Subtracted Edge Enhancement Percent Gain	[0019,xx0B]	as set
Subtracted Edge Enhancement LUT Index	[0019,xx0C]	as set
Subtracted Edge Enhancement Kernel Size	[0019,xx0D]	as set
Fade Percent	[0019,xx0E]	as set
Flipped before Laterality Applied	[0019,xx0F]	
Apply Fade	[0019,xx10]	as set
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	from Original
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	from Original
Acquisition Number	[0020,0012]	
Image Number	[0020,0013]	
Patient Orientation	[0020,0020]	from Original or zero length
Image Comments	[0020,4000]	SM
Samples per Pixel	[0028,0002]	1
Photometric Interpretation	[0028,0004]	MONOCHROME2
Rows	[0028,0010]	from Original
Columns	[0028,0011]	from Original
Bits Allocated	[0028,0100]	from Original
Bits Stored	[0028,0101]	from Original
High Bit	[0028,0102]	from Original
Pixel Representation	[0028,0103]	0
Pixel Intensity Relationship	[0028,1040]	DISP
Window Center	[0028,1050]	
Window Width	[0028,1051]	
Recommended Viewing Mode	[0028,1090]	SUB | NAT
Representative Frame Number	[0028,6010]	1
Requested Procedure Desription	[0032,1060]	from Original
Study Comments	[0032,4000]	from Original
Performed Procedure Step Start Date	[0040,0244]	from Original

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Table 16: *overview of supplied attributes - XA/XRF derived image (Monochrome) Store Monitor*

Attribute Name	Tag	Value
Performed Procedure Step Start Time	[0040,0245]	from Original
Performed Procedure Step ID	[0040,0253]	from Original
Request Attributes Sequence	[0040,0275]	from Original
>*item contents as provided*		from Original
Overlay Rows	[60xx,0010]	
Overlay Columns	[60xx,0011]	
Overlay Description	[60xx,0022]	<pre-canned description>
Overlay Type	[60xx,0040]	G
Origin	[60xx,0050]	1\1
Overlay Bits Allocated	[60xx,0100]	Same as [0028,0100] or 1 (if Overlay encoded in [60xx,3000])
Bit Position	[60xx,0102]	12 or 0 (if Overlay encoded in [60xx,3000])
Overlay Data	[6000,3000]	(with Offline Media Instances) Graphics Overlay
Pixel Data	[7FE0,0010]	

A.6.2 IIDC images (input/results)

Table 17: *overview of supplied attributes - XA derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	from Original
Image Type	[0008,0008]	from Original or DERIVED\SECONDARY\<values from original>\PHANTOM\<SW version> or DERIVED\SECONDARY\<values from original>\CORRECTED\<SW version>
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.12.1
SOP Instance UID	[0008,0018]	
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	if 'new series': <yyyymmdd> if 'append series': from Original
Acquisition Date	[0008,0022]	from Original
Image Date	[0008,0023]	<yyyymmdd> (Date of Creation)
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	if 'new series': <hhmmss> if 'append series': from Original

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Table 17: *overview of supplied attributes - XA derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Acquisition Time	[0008,0032]	from Original
Image Time	[0008,0033]	<hhmmss> (Time of Creation)
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	from Original
Manufacturer	[0008,0070]	from Original
Institution Name	[0008,0080]	from Original
Institution Address	[0008,0081]	from Original
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	if 'new series': from WS Configuration if 'append series': from Original
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	if 'new series': from "Save as" dialog if 'append series': from Original
Institutional Department Name	[0008,1040]	if 'new series': from WS Configuration if 'append series': from Original
Performing Physicians´ Name	[0008,1050]	input via "Correct" or from Original
Operator´s Name	[0008,1070]	from Original
Admitting Diagnoses Description	[0008,1080]	from Original
Manufacturer´s Model Name	[0008,1090]	if 'new series': LEONARDO if 'append series': from Original
Derivation Description	[0008,2111]	<pre-canned texts>
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Patient´s Age	[0010,1010]	from Original
Patient´s Size	[0010,1020]	from Original
Patient's Weight	[0010,1030]	from Original
Patient Comments	[0010,4000]	from Original
Contrast/Bolus Agent	[0018,0010]	from Original
KVP	[0018,0060]	from Original
Device Serial Number	[0018,1000]	from Original
Software Versions	[0018,1020]	from Original
Protocol Name	[0018,1030]	if 'new series': same as Series Description if 'append series': from Original

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Table 17: *overview of supplied attributes - XA derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Contrast/Bolus Ingredient	[0018,1048]	from Original
Distance Source to Detector	[0018,1110]	from Original
Distance Source to Patient	[0018,1111]	from Original
Estimated Radiographic Magnification Factor	[0018,1114]	from Original
Exposure Time	[0018,1150]	from Original
X-Ray Tube Current	[0018,1151]	from Original
Average Pulse Width	[0018,1154]	from Original
Radiation Setting	[0018,1155]	from Original
Radiation Mode	[0018,115A]	from Original
Image Area Dose Product	[0018,115E]	from Original
Intensifier Size	[0018,1162]	from Original
Imager Pixel Spacing	[0018,1164]	<zero length> (forced setting)
Grid	[0018,1166]	from Original
Positioner Motion	[0018,1500]	<zero length> (forced setting)
Positioner Primary Angle	[0018,1510]	from Original
Positioner Secondary Angle	[0018,1511]	from Original
Detector Primary Angle	[0018,1530]	from Original
Detector Secondary Angle	[0018,1531]	from Original
Shutter Shape	[0018,1600]	from Original/as set
Shutter Left Vertical Edge	[0018,1602]	as set
Shutter Right Vertical Edge	[0018,1604]	as set
Shutter Upper Horizontal Edge	[0018,1606]	as set
Shutter Lower Horizontal Edge	[0018,1608]	as set
Center of Circular Shutter	[0018,1610]	from Original
Radius of Circular Shutter	[0018,1612]	from Original
Collimator Shape	[0018,1700]	from Original
Collimator Left Vertical Edge	[0018,1702]	from Original
Collimator Right Vertical Edge	[0018,1704]	from Original
Collimator Upper Horizontal Edge	[0018,1706]	from Original
Collimator Lower Horizontal Edge	[0018,1708]	from Original
Center of Circular Collimator	[0018,1710]	from Original
Radius of Circular Collimator	[0018,1712]	from Original
Vertices of the Polygonal Collimator	[0018,1720]	from Original

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Table 17: *overview of supplied attributes - XA derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	if 'new series': <new UID> if 'append series': from Original
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	if 'new series': <highest series number+1> if 'append series': from Original
Image Number	[0020,0013]	if 'new series': 1 if 'append series': <highest image number+1>
Patient Orientation	[0020,0020]	<zero length> (forced setting)
Image Comments	[0020,4000]	from Original or "Used for Measurement" or "Corrected Image"
Samples per Pixel	[0028,0002]	1
Photometric Interpretation	[0028,0004]	MONOCHROME2
Rows	[0028,0010]	from Original
Columns	[0028,0011]	from Original
Bits Allocated	[0028,0100]	from Original
Bits Stored	[0028,0101]	from Original
High Bit	[0028,0102]	from Original
Pixel Representation	[0028,0103]	from Original
Pixel Intensity Relationship	[0028,1040]	from Original
Window Center	[0028,1050]	from Original
Window Width	[0028,1051]	from Original
Representative Frame Number	[0028,6010]	1
Requested Procedure Desription	[0032,1060]	from Original
Study Comments	[0032,4000]	from Original
Performed Procedure Step Start Date	[0040,0244]	if 'new series': <zero length> if 'append series': from Original
Performed Procedure Step Start Time	[0040,0245]	if 'new series': <zero length> if 'append series': from Original
Performed Procedure Step ID	[0040,0253]	if 'new series': <zero length> if 'append series': from Original
Request Attributes Sequence	[0040,0275]	from Original
>item contents as provided		from Original
Overlay Rows	[60xx,0010]	Only if corrected / superimposed crosshairs: Same as (0028,0010)

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Table 17: *overview of supplied attributes - XA derived image (Monochrome) from IIDC*

Attribute Name	Tag	Value
Overlay Columns	[60xx,0011]	Only if corrected / superimposed crosshairs: Same as (0028,0011)
Overlay Description	[60xx,0022]	Only if corrected / superimposed crosshairs: <pre-canned description>
Overlay Type	[60xx,0040]	Only if corrected / superimposed crosshairs: G
Origin	[60xx,0050]	Only if corrected / superimposed crosshairs: 1\1
Overlay Bits Allocated	[60xx,0100]	Only if corrected / superimposed crosshairs: Same as [0028,0100] or 1 (if Overlay encoded in [60xx,3000])
Bit Position	[60xx,0102]	Only if corrected / superimposed crosshairs: 12 or 0 (if Overlay encoded in [60xx,3000])
Overlay Data	[6000,3000]	Only if corrected / superimposed crosshairs: (with Offline Media Instances) Graphics Overlay
Pixel Data	[7FE0,0010]	

A.6.3 InSpaceIS corrected input images

Table 18: *overview of supplied attributes - XA derived image (Monochrome) InSpace corrected input*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	from Original or conf. Character Set
Image Type	[0008,0008]	DERIVED\SECONDARY\SINGLE PLANE\COR-RECTED
SOP Class UID	[0008,0016]	1.2.840.10008.5.1.4.1.1.12.1
SOP Instance UID	[0008,0018]	<new UID>
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	<yyyymmdd> (Date of Creation)
Acquisition Date	[0008,0022]	Derived from original Acquisition/Image Date or zero length
Image Date	[0008,0023]	<yyyymmdd> (Date of Creation)
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	<hhmmss>
Acquisition Time	[0008,0032]	Derived from original Acquisition/Image Time or zero length
Image Time	[0008,0033]	<hhmmss> (Time of Creation)

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Table 18: *overview of supplied attributes - XA derived image (Monochrome) InSpace corrected input*

Attribute Name	Tag	Value
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	OT
Manufacturer	[0008,0070]	Siemens
Institution Name	[0008,0080]	from WS Configuration
Institution Address	[0008,0081]	from WS Configuration
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	from WS Configuration
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	"Images for VOI selection"
Institutional Department Name	[0008,1040]	from WS Configuration
Performing Physicians´ Name	[0008,1050]	from Original
Operator´s Name	[0008,1070]	from Original
Admitting Diagnoses Description	[0008,1080]	from Original
Manufacturer´s Model Name	[0008,1090]	from Original
Patient´s Name	[0010,0010]	from Original
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Patient´s Age	[0010,1010]	from Original
Patient´s Size	[0010,1020]	from Original
Patient‘s Weight	[0010,1030]	from Original
Patient Comments	[0010,4000]	from Original
Contrast/Bolus Agent	[0018,0010]	from Original
KVP	[0018,0060]	from Original
Device Serial Number	[0018,1000]	from Original
Software Versions	[0018,1020]	from Original + "\<WS version>"
Protocol Name	[0018,1030]	from Original
Contrast/Bolus Ingredient	[0018,1048]	from Original
Distance Source to Detector	[0018,1110]	from Original
Distance Source to Patient	[0018,1111]	from Original
Estimated Radiographic Magnification Factor	[0018,1114]	from Original
Exposure Time	[0018,1150]	from Original
X-Ray Tube Current	[0018,1151]	from Original

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Table 18: *overview of supplied attributes - XA derived image (Monochrome) InSpace corrected input*

Attribute Name	Tag	Value
Average Pulse Width	[0018,1154]	from Original
Radiation Setting	[0018,1155]	from Original
Radiation Mode	[0018,115A]	from Original
Image Area Dose Product	[0018,115E]	from Original
Intensifier Size	[0018,1162]	from Original
Imager Pixel Spacing	[0018,1164]	from Original
Date of last Calibration	[0018,1200]	<yyyymmdd>
Positioner Motion	[0018,1500]	
Positioner Primary Angle	[0018,1510]	extracted from Original image data-set
Positioner Secondary Angle	[0018,1511]	extracted from Original image data-set
Detector Primary Angle	[0018,1530]	from Original
Detector Secondary Angle	[0018,1531]	from Original
Shutter Shape	[0018,1600]	from Original
Shutter Left Vertical Edge	[0018,1602]	from Original
Shutter Right Vertical Edge	[0018,1604]	from Original
Shutter Upper Horizontal Edge	[0018,1606]	from Original
Shutter Lower Horizontal Edge	[0018,1608]	from Original
Center of Circular Shutter	[0018,1610]	from Original
Radius of Circular Shutter	[0018,1612]	from Original
Collimator Shape	[0018,1700]	from Original
Collimator Left Vertical Edge	[0018,1702]	from Original
Collimator Right Vertical Edge	[0018,1704]	from Original
Collimator Upper Horizontal Edge	[0018,1706]	from Original
Collimator Lower Horizontal Edge	[0018,1708]	from Original
Center of Circular Collimator	[0018,1710]	from Original
Radius of Circular Collimator	[0018,1712]	from Original
Vertices of the Polygonal Collimator	[0018,1720]	from Original
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	<new UID>
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	
Acquisition Number	[0020,0012]	from Original
Image Number	[0020,0013]	

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Table 18: *overview of supplied attributes - XA derived image (Monochrome) InSpace corrected input*

Attribute Name	Tag	Value
Patient Orientation	[0020,0020]	removed
Laterality	[0020,0060]	from Original
Images in Acquisition	[0020,1002]	removed
Image Comments	[0020,4000]	from Original
Samples per Pixel	[0028,0002]	1
Photometric Interpretation	[0028,0004]	MONOCHROME2
Rows	[0028,0010]	from Original
Columns	[0028,0011]	from Original
Bits Allocated	[0028,0100]	from Original
Bits Stored	[0028,0101]	from Original
High Bit	[0028,0102]	from Original
Pixel Representation	[0028,0103]	0
Pixel Intensity Relationship	[0028,1040]	LIN
Window Center	[0028,1050]	
Window Width	[0028,1051]	
Recommended Viewing Mode	[0028,1090]	NAT
Representative Frame Number	[0028,6010]	1
Requested Procedure Desription	[0032,1060]	from Original
Study Comments	[0032,4000]	from Original
Performed Procedure Step Start Date	[0040,0244]	from Original
Performed Procedure Step Start Time	[0040,0245]	from Original
Performed Procedure Step ID	[0040,0253]	from Original
Request Attributes Sequence	[0040,0275]	from Original
>item contents as provided		from Original
Overlay Rows	[60xx,0010]	
Overlay Columns	[60xx,0011]	
Overlay Description	[60xx,0022]	<pre-canned description>
Overlay Type	[60xx,0040]	G
Origin	[60xx,0050]	1\1
Overlay Bits Allocated	[60xx,0100]	Same as [0028,0100] or 1 (if Overlay encoded in [60xx,3000])
Bit Position	[60xx,0102]	12 or 0 (if Overlay encoded in [60xx,3000])
Overlay Data	[6000,3000]	(with Offline Media Instances) Graphics Overlay

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Table 18: *overview of supplied attributes - XA derived image (Monochrome) InSpace corrected input*

Attribute Name	Tag	Value
Pixel Data	[7FE0,0010]	

A.7 CT Standard Extended SOP Class

The Somaris/5 application will create functional images from special applications. Some of these will be encoded as CT Standard extended SOP Class. Please see the following tables for a selected overview of supplied Standard attributes.

A.7.1 Calcium Scoring

Somaris/5 Calcium Scoring will create Overview (MPR) and MIP images. The following table provides information about image attributes created:

Table 19: *Calcium Scoring*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	Type 1: “DERIVED” Type 2: “SECONDARY” Type 3: “AXIAL” or “OTHER” Type 4: “CSA MPR” or “CSA MIP” or “CSA MIP THIN”
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<Date of first series>
Series Date	(0008,0021)	<Date of Creation>
Acquisition Date	(0008,0022)	<from Original>
Content Date	(0008,0023)	<from Original>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<Time of Creation of Series Instance>
Acquisition Time	(0008,0032)	<Time of Exposure resulting in this image>
Content Time	(0008,0033)	<Time of Instance Creation>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	“CT”

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Table 19: *Calcium Scoring*

Attribute Name	Tag	Value
Manufacturer	(0008,0070)	“SIEMENS”
Institution Name	(0008,0080)	<from Original>
Institution Address	(0008,0081)	<from Original>
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	Computer name
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	<original Series name + “CaScoring” or “MPR Collection” or “MIP Collection”>
Institutional Department Name	(0008,1040)	<from Configuration>
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	<from Registration UI>
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	Somaris/5CaScoring
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	Reference to original image or empty
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Derivation Description	(0008,2111)	<from configuration>
Source Image Sequence	(0008,2112)	Reference to original image or empty
> Referenced SOP Class UID	(0008,1150)	

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Table 19: Calcium Scoring

Attribute Name	Tag	Value
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Contrast/Bolus Agent	(0018,0010)	-
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	<from Original>
Slice Thickness	(0018,0050)	<from Original>
Scan Options	(0018,0022)	-
KVP	(0018,0060)	<from Original>
Data Collection Diameter	(0018,0090)	<from Original>
Device Serial Number	(0018,1000)	-
Software Version(s)	(0018,1020)	<from Configuration>
Protocol Name	(0018,1030)	<from Original>
Contrast/Bolus Route	(0018,1040)	-

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Table 19: *Calcium Scoring*

Attribute Name	Tag	Value
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	-
Reconstruction Diameter	(0018,1100)	-
Distance Source to Detector	(0018,1110)	<from Original>
Distance Source to Patient	(0018,1111)	<from Original>
Gantry/Detector Tilt	(0018,1120)	<from Original>
Table Height	(0018,1130)	<from Original>
Rotation Direction	(0018,1140)	<from Original>
Exposure Time	(0018,1150)	<from Original>
X-Ray Tube Current	(0018,1151)	<from Original>
Exposure	(0018,1152)	<from Original>
Exposure in µAs	(0018,1153)	-
Filter Type	(0018,1160)	<from Original>
Generator Power	(0018,1170)	<from Original>
Focal Spot	(0018,1190)	<from Original>
Date of last Calibration	(0018,1200)	-
Time of last Calibration	(0018,1201)	-
Convolution Kernel	(0018,1210)	<from Original>
Patient Position	(0018,5100)	<from Original>
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<created by system>
Acquisition Number	(0020,0012)	<from Original>
Instance Number	(0020,0013)	<created by system>
Patient Orientation	(0020,0020)	-

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Table 19: *Calcium Scoring*

Attribute Name	Tag	Value
Image Position (Patient)	(0020,0032)	<from Original>
Image Orientation (Patient)	(0020,0037)	<application generated data>
Frame of Reference UID	(0020,0052)	<new UID> (same within identical coordinate system)
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	-
Slice Location	(0020,1041)	Relative position of exposure expressed in terms of the patient table position (must not be used for calculations)
Image Comments	(0020,4000)	<from Original>
Private Creator	(0021,00xx)	-
Target	(0021,xx11)	-
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	“MONOCHROME2”
Rows	(0028,0010)	512
Columns	(0028,0011)	512
Pixel Spacing	(0028,0030)	<calculated by system>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	<from Original>
Window Width	(0028,1051)	<from Original>
Rescale Intercept	(0028,1052)	-1024 or -10240
Rescale Slope	(0028,1053)	1 or 10
Window Center & Width Explanation	(0028,1055)	“WINDOW1\WINDOW2”

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Table 19: *Calcium Scoring*

Attribute Name	Tag	Value
Lossy Image Compression	(0028,2110)	<from Configuration>
Lossy Image Compression Ratio	(0028,2112)	<from Configuration>
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	512
Overlay Columns	(60xx,0011)	512
Overlay Description	(60xx,0022)	Siemens MedCom Object Graphics
Overlay Subtype	(60xx,0045)	-
Overlay Type	(60xx,0040)	
Overlay Origin	(60xx,0050)	-
Overlay Bits Allocated	(60xx,0100)	1
Overlay Bit Position	(60xx,0102)	0
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-

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Table 19: *Calcium Scoring*

Attribute Name	Tag	Value
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	<filled by application>
Pixel Data	(7FE0,0010)	<filled by application>

A.7.2 Dental CT

Somaris/5 Dental CT will create Overview (MPR) and MIP images. The following table provides information about image attributes created:

Table 20: *Dental CT*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	Overview= "DERIVED", "SECONDARY", "AXIAL", "CT_SOM5 MPR" MIP= "DERIVED", "SECONDARY", "AXIAL", "CT_SOM5 MIP"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	yes
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	yes
Acquisition Date	(0008,0022)	yes
Content Date	(0008,0023)	yes
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	yes
Acquisition Time	(0008,0032)	yes
Content Time	(0008,0033)	yes
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	yes
Manufacturer	(0008,0070)	yes
Institution Name	(0008,0080)	yes
Institution Address	(0008,0081)	-

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Table 20: *Dental CT*

Attribute Name	Tag	Value
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	yes
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	yes
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	yes
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	yes
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	yes
Source Image Sequence	(0008,2112)	yes
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	-
Patient´s Name	(0010,0010)	<as Original>

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Table 20: *Dental CT*

Attribute Name	Tag	Value
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	-
Slice Thickness	(0018,0050)	yes
KVP	(0018,0060)	yes
Data Collection Diameter	(0018,0090)	yes
Device Serial Number	(0018,1000)	yes
Software Version(s)	(0018,1020)	-
Protocol Name	(0018,1030)	-
Spatial Resolution	(0018,1050)	-
Distance Source to Detector	(0018,1110)	yes
Distance Source to Patient	(0018,1111)	yes
Gantry/Detector Tilt	(0018,1120)	yes
Table Height	(0018,1130)	yes
Rotation Direction	(0018,1140)	yes
Exposure Time	(0018,1150)	yes
X-Ray Tube Current	(0018,1151)	yes
Exposure	(0018,1152)	yes
Exposure in µAs	(0018,1153)	-
Generator Power	(0018,1170)	yes
Focal Spot	(0018,1190)	yes
Date of last Calibration	(0018,1200)	yes

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Table 20: *Dental CT*

Attribute Name	Tag	Value
Time of last Calibration	(0018,1201)	yes
Convolution Kernel	(0018,1210)	yes
Patient Position	(0018,5100)	yes
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	yes
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	yes
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	yes
Image Position (Patient)	(0020,0032)	yes
Image Orientation (Patient)	(0020,0037)	yes
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Slice Location	(0020,1041)	yes
Image Comments	(0020,4000)	yes
Samples per Pixel	(0028,0002)	yes
Photometric Interpretation	(0028,0004)	yes
Rows	(0028,0010)	yes
Columns	(0028,0011)	yes
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	yes
Bits Stored	(0028,0101)	yes
High Bit	(0028,0102)	yes
Pixel Representation	(0028,0103)	yes
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0300)	-
Window Center	(0028,1050)	yes
Window Width	(0028,1051)	yes
Rescale Intercept	(0028,1052)	yes

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Table 20: *Dental CT*

Attribute Name	Tag	Value
Rescale Slope	(0028,1053)	yes
Window Center & Width Explanation	(0028,1055)	yes
Pixel Padding Value	(0028,1020)	-
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	yes
Overlay Columns	(60xx,0011)	yes
Number of Frames in Overlay	(60xx,0015)	“1”

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Table 20: *Dental CT*

Attribute Name	Tag	Value
Overlay Description	(60xx,0022)	“Siemens MedCom Object Graphics"
Overlay Subtype	(60xx,0045)	-
Overlay Type	(60xx,0040)	yes
Overlay Origin	(60xx,0050)	yes
Image Frame Origin	(60xx,0051)	yes
Overlay Bits Allocated	(60xx,0100)	yes
Overlay Bit Position	(60xx,0102)	yes
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	yes
Pixel Data	(7FE0,0010)	yes

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A.7.3 DynEva

Somaris/5 DynEva application will create CT result images (see A.8 for SC result images). The following table provides information about image attributes created

Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	“ISO_IR 100”
Image Type	(0008,0008)	"DERIVED", "SECONDARY", "AXIAL", "CT_SOM5 DYB" or "DERIVED", "SECONDARY", "AXIAL", "CT_SOM5 DYF"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	(Date of Creation)
Acquisition Date	(0008,0022)	-
Content Date	(0008,0023)	(Date of Instance Creation)
Acquisition Datetime	(0008,002A)	set for fused images to the date of the 1st image

Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	(Date of Creation)
Acquisition Time	(0008,0032)	set for fused images to the time of the 1st image
Content Time	(0008,0033)	(Time of Instance Creation)
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	“CT”
Manufacturer	(0008,0070)	“SIEMENS”
Institution Name	(0008,0080)	taken from local config
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	hostname
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“DynEva Curves”+<Evaluation Number>
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	-
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	-
Operator´s Name	(0008,1070)	-
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	read from modality config
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-

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Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	“Som5 DynEva Resampled"
Source Image Sequence	(0008,2112)	reference to fused input images
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Contrast/Bolus Agent	(0018,0010)	-
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	copied from original
Slice Thickness	(0018,0050)	copied from original
Scan Options	(0018,0022)	-
KVP	(0018,0060)	copied from original

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Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
Data Collection Diameter	(0018,0090)	copied from original
Device Serial Number	(0018,1000)	read from the local config
Software Version(s)	(0018,1020)	read from modality config
Protocol Name	(0018,1030)	copied from original image series
Contrast/Bolus Route	(0018,1040)	-
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	-
Reconstruction Diameter	(0018,1100)	copied from original mod image
Distance Source to Detector	(0018,1110)	copied from original mod image
Distance Source to Patient	(0018,1111)	copied from original mod image
Gantry/Detector Tilt	(0018,1120)	copied from original image
Table Height	(0018,1130)	copied from original image
Rotation Direction	(0018,1140)	copied from original image
Exposure Time	(0018,1150)	-
X-Ray Tube Current	(0018,1151)	-
Exposure	(0018,1152)	-
Exposure in µAs	(0018,1153)	-
Filter Type	(0018,1160)	-
Generator Power	(0018,1170)	-
Focal Spot	(0018,1190)	-
Date of last Calibration	(0018,1200)	-
Time of last Calibration	(0018,1201)	-
Convolution Kernel	(0018,1210)	-
Patient Position	(0018,5100)	copied from original image
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>

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Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<max series number>+1
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	(unknown)
Patient Orientation	(0020,0020)	-
Image Position (Patient)	(0020,0032)	avg of min and max imageposition (z-axis)
Image Orientation (Patient)	(0020,0037)	copied from original
Frame of Reference UID	(0020,0052)	<new UID>
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	-
Slice Location	(0020,1041)	avg of 1st and last location
Image Comments	(0020,4000)	e.g.: "DynEva MIP", "DynEva Baseline", "DynEva Peak Enhancement", "DynEva Fused MultiSlice", "DynEva Time To Peak", "DynEva Average", "DynEva Absolute Enhancement Curves",
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	“MONOCHROME2”
Rows	(0028,0010)	512
Columns	(0028,0011)	512
Pixel Spacing	(0028,0030)	<calculated by system>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-

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Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
Window Center	(0028,1050)	(unknown)
Window Width	(0028,1051)	(unknown)
Rescale Intercept	(0028,1052)	-1024
Rescale Slope	(0028,1053)	1
Window Center & Width Explanation	(0028,1055)	“WINDOW1/WINDOW2”
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	-
> Requested Procedure ID	(0040,1001)	-
> Scheduled Procedure Step ID	(0040,0009)	-
> Scheduled Procedure Step Description	(0040,0007)	-
> Scheduled Protocol Code Sequence	(0040,0008)	-
>> Code Sequence Macro		-
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	512
Overlay Columns	(60xx,0011)	512
Overlay Description	(60xx,0022)	"Siemens MedCom Object Graphics"
Overlay Subtype	(60xx,0045)	-
Overlay Type	(60xx,0040)	G
Overlay Origin	(60xx,0050)	-

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Table 21: *DynEva created CT images*

Attribute Name	Tag	Value
Overlay Bits Allocated	(60xx,0100)	1
Overlay Bit Position	(60xx,0102)	0
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	<created by the application>
Pixel Data	(7FE0,0010)	<created by system>

A.7.4 Lung Care

Somaris/5 Lung Care will create CT result images (for SC result images see A.8). The following table provides information about image attributes created:

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Table 22: *LungCARE - CT Images*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	<yes>
Image Type	(0008,0008)	“DERIVED\SECONDARY\OTHER\MPR” or “DERIVED\SECONDARY\OTHER\CT_SOM5 SPI”
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UId>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	-
Acquisition Date	(0008,0022)	<yes>
Content Date	(0008,0023)	<yes>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	-
Acquisition Time	(0008,0032)	<yes>
Content Time	(0008,0033)	<yes>
Accession Number	(0008,0050)	<as Original>

Table 22: *LungCARE - CT Images*

Attribute Name	Tag	Value
Modality	(0008,0060)	“CT”
Manufacturer	(0008,0070)	<yes>
Institution Name	(0008,0080)	<yes>
Institution Address	(0008,0081)	“-”
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	-
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	e.g. “SCREENING #1_result_1_1_VRT” or “SCREENING #1_result_1_2_MPR”
Institutional Department Name	(0008,1040)	from Site Configuration
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	“DR. CHACHOUA”
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	from Registration UI
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	<yes>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Derivation Description	(0008,2111)	- (may be set by subsequent applications)

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Table 22: *LungCARE - CT Images*

Attribute Name	Tag	Value
Source Image Sequence	(0008,2112)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Contrast/Bolus Agent	(0018,0010)	(unknown)
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	<yes>
Slice Thickness	(0018,0050)	<yes>
Scan Options	(0018,0022)	<yes>
KVP	(0018,0060)	<yes>
Data Collection Diameter	(0018,0090)	<yes>
Device Serial Number	(0018,1000)	<yes>
Software Version(s)	(0018,1020)	<yes>

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Table 22: *LungCARE - CT Images*

Attribute Name	Tag	Value
Protocol Name	(0018,1030)	-
Contrast/Bolus Route	(0018,1040)	-
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	-
Reconstruction Diameter	(0018,1100)	<yes>
Distance Source to Detector	(0018,1110)	<yes>
Distance Source to Patient	(0018,1111)	<yes>
Gantry/Detector Tilt	(0018,1120)	<yes>
Table Height	(0018,1130)	<yes>
Rotation Direction	(0018,1140)	<yes>
Exposure Time	(0018,1150)	<yes>
X-Ray Tube Current	(0018,1151)	<yes>
Exposure	(0018,1152)	<yes>
Exposure in µAs	(0018,1153)	-
Filter Type	(0018,1160)	<yes>
Generator Power	(0018,1170)	<yes>
Focal Spot	(0018,1190)	<yes>
Date of last Calibration	(0018,1200)	<yes>
Time of last Calibration	(0018,1201)	<yes>
Convolution Kernel	(0018,1210)	<yes>
Patient Position	(0018,5100)	<yes>
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<yes>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<yes>
Acquisition Number	(0020,0012)	<yes>

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Table 22: *LungCARE - CT Images*

Attribute Name	Tag	Value
Instance Number	(0020,0013)	<yes>
Patient Orientation	(0020,0020)	
Image Position (Patient)	(0020,0032)	<yes>
Image Orientation (Patient)	(0020,0037)	<yes>
Frame of Reference UID	(0020,0052)	<yes>
Laterality	(0020,0060)	
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	-
Slice Location	(0020,1041)	<yes>
Image Comments	(0020,4000)	
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	“MONOCHROME2”
Rows	(0028,0010)	512
Columns	(0028,0011)	512
Pixel Spacing	(0028,0030)	<yes>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0300)	-
Window Center	(0028,1050)	<yes>
Window Width	(0028,1051)	<yes>
Rescale Intercept	(0028,1052)	-1024
Rescale Slope	(0028,1053)	1
Window Center & Width Explanation	(0028,1055)	<yes>
Pixel Padding Value	(0028,1020)	-
Lossy Image Compression	(0028,2110)	- (may be set by subsequent applications)

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Table 22: *LungCARE - CT Images*

Attribute Name	Tag	Value
Lossy Image Compression Ratio	(0028,2112)	- (may be set by subsequent applications)
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
(various private data)	(0029,xxxx)	
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	
Performed Procedure Step Start Date	(0040,0244)	
Performed Procedure Step Start Time	(0040,0245)	
Performed Procedure Step Description	(0040,0254)	
Performed Protocol Code Sequence	(0040,0260)	
> Code Sequence Macro		
Comments on the Performed Procedure Step	(0040,0280)	
Icon Image Sequence	(0088,0200)	
> Image Pixel Module		
Presentation LUT Shape	(2050,0020)	-
Pixel Data	(7FE0,0010)	<yes>

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A.7.5 Osteo CT

Somaris/5 Osteo CT will create CT result images (for SC result images see A.8). The following table provides information about image attributes created:

Table 23: *Osteo CT*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	"DERIVED", "SECONDARY", "AXIAL", "CT_SOM5 OEVA"

Table 23: *Osteo CT*

Attribute Name	Tag	Value
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<date of series creation>
Acquisition Date	(0008,0022)	-
Content Date	(0008,0023)	<date of content creation>
Acquisition Datetime	(0008,002A)	<from Original>
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<time of series creation>
Acquisition Time	(0008,0032)	<from Original>
Content Time	(0008,0033)	<time of content creation>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	<from Original>
Manufacturer	(0008,0070)	<from Original>
Institution Name	(0008,0080)	<from Original>
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	<from Original>
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	<Contours + “Evaluation Number“> <Tables + “Evaluation Number”> <Summary + “Evaluation Number”> <(explicit)>
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	-
Admitting Diagnoses Description	(0008,1080)	<as Original>

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Table 23: *Osteo CT*

Attribute Name	Tag	Value
Manufacturer´s Model Name	(0008,1090)	<from Original>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>

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Table 23: *Osteo CT*

Attribute Name	Tag	Value
Contrast/Bolus Agent	(0018,0010)	-
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	-
Slice Thickness	(0018,0050)	<from Original>
Scan Options	(0018,0022)	-
KVP	(0018,0060)	<from Original>
Data Collection Diameter	(0018,0090)	<from Original>
Device Serial Number	(0018,1000)	<from Original>
Software Version(s)	(0018,1020)	-
Protocol Name	(0018,1030)	-
Contrast/Bolus Route	(0018,1040)	-
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	-
Reconstruction Diameter	(0018,1100)	-
Distance Source to Detector	(0018,1110)	<from Original>
Distance Source to Patient	(0018,1111)	<from Original>
Gantry/Detector Tilt	(0018,1120)	<from Original>
Table Height	(0018,1130)	<from Original>
Rotation Direction	(0018,1140)	<from Original>
Exposure Time	(0018,1150)	<from Original>

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Table 23: *Osteo CT*

Attribute Name	Tag	Value
X-Ray Tube Current	(0018,1151)	-
Exposure	(0018,1152)	<from Original>
Exposure in µAs	(0018,1153)	-
Filter Type	(0018,1160)	-
Generator Power	(0018,1170)	<from Original>
Focal Spot	(0018,1190)	<from Original>
Date of last Calibration	(0018,1200)	<from Original>
Time of last Calibration	(0018,1201)	<from Original>
Convolution Kernel	(0018,1210)	<from Original>
Patient Position	(0018,5100)	<from Original>
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<same series number for each examination>
Acquisition Number	(0020,0012)	<same series number for each examination>
Instance Number	(0020,0013)	<from Original>
Patient Orientation	(0020,0020)	-
Image Position (Patient)	(0020,0032)	<from Original>
Image Orientation (Patient)	(0020,0037)	<from Original>
Frame of Reference UID	(0020,0052)	<new UID>
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	-
Slice Location	(0020,1041)	<from Original>
Image Comments	(0020,4000)	<from Original>
Samples per Pixel	(0028,0002)	<from Original>
Photometric Interpretation	(0028,0004)	<from Original>
Rows	(0028,0010)	<from Original>
Columns	(0028,0011)	<from Original>
Pixel Spacing	(0028,0030)	<calculated by system>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12

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Table 23: *Osteo CT*

Attribute Name	Tag	Value
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	<from UI and Configuration>
Window Width	(0028,1051)	<from UI and Configuration>
Rescale Intercept	(0028,1052)	<from Original>
Rescale Slope	(0028,1053)	<from Original>
Window Center & Width Explanation	(0028,1055)	“WINDOW1\WINDOW2”
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
(various private data)	(0029,xxxx)	
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-

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Table 23: *Osteo CT*

Attribute Name	Tag	Value
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	512
Overlay Columns	(60xx,0011)	512
Overlay Description	(60xx,0022)	-
Overlay Subtype	(60xx,0045)	Siemens MedCom Object Graphics
Overlay Type	(60xx,0040)	G
Overlay Origin	(60xx,0050)	-
Overlay Bits Allocated	(60xx,0100)	1
Overlay Bit Position	(60xx,0102)	0
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	<created by system>
Pixel Data	(7FE0,0010)	<as Original>

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A.7.6 Pulmo CT

Somaris/5 Pulmo CT will create CT result images. The following table provides information about image attributes created:

Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	"DERIVED", "SECONDARY", "AXIAL", "CT_SOM5 PEVI"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UID>

Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<yes>
Acquisition Date	(0008,0022)	<yes>
Content Date	(0008,0023)	<yes>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<yes>
Acquisition Time	(0008,0032)	<yes>
Content Time	(0008,0033)	<yes>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	CT
Manufacturer	(0008,0070)	SIEMENS
Institution Name	(0008,0080)	<yes>
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	<from Original>
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“Colored Subranges” or “Colored Percentiles” or “Segment Images” or “Histograms” or “3D Prep”
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	-
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	<from Original>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>

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Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	-
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Contrast/Bolus Agent	(0018,0010)	-
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-

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Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	-
Slice Thickness	(0018,0050)	<yes>
Scan Options	(0018,0022)	-
KVP	(0018,0060)	<yes>
Data Collection Diameter	(0018,0090)	<yes>
Device Serial Number	(0018,1000)	<yes>
Software Version(s)	(0018,1020)	-
Protocol Name	(0018,1030)	-
Contrast/Bolus Route	(0018,1040)	-
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	-
Reconstruction Diameter	(0018,1100)	-
Distance Source to Detector	(0018,1110)	<yes>
Distance Source to Patient	(0018,1111)	<yes>
Gantry/Detector Tilt	(0018,1120)	<yes>
Table Height	(0018,1130)	<yes>
Rotation Direction	(0018,1140)	<yes>
Exposure Time	(0018,1150)	<yes>
X-Ray Tube Current	(0018,1151)	-
Exposure	(0018,1152)	<yes>
Exposure in µAs	(0018,1153)	-

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Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Filter Type	(0018,1160)	<yes>
Generator Power	(0018,1170)	<yes>
Focal Spot	(0018,1190)	<yes>
Date of last Calibration	(0018,1200)	<yes>
Time of last Calibration	(0018,1201)	<yes>
Convolution Kernel	(0018,1210)	<yes>
Patient Position	(0018,5100)	<yes>
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<yes>
Acquisition Number	(0020,0012)	<yes>
Instance Number	(0020,0013)	<yes>
Patient Orientation	(0020,0020)	-
Image Position (Patient)	(0020,0032)	<yes>
Image Orientation (Patient)	(0020,0037)	<yes>
Frame of Reference UID	(0020,0052)	<yes>
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	-
Slice Location	(0020,1041)	<from Original>
Image Comments	(0020,4000)	<from Original>
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	MONOCHROME2
Rows	(0028,0010)	512
Columns	(0028,0011)	512
Pixel Spacing	(0028,0030)	<calculated by system>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-

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Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	<yes>
Window Width	(0028,1051)	<yes>
Rescale Intercept	(0028,1052)	<yes>
Rescale Slope	(0028,1053)	<yes>
Window Center & Width Explanation	(0028,1055)	<yes>
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-

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Table 24: *Pulmo CT*

Attribute Name	Tag	Value
Overlay Rows	(60xx,0010)	<yes>
Overlay Columns	(60xx,0011)	<yes>
Overlay Description	(60xx,0022)	<yes>
Overlay Subtype	(60xx,0045)	<yes>
Overlay Type	(60xx,0040)	<yes>
Overlay Origin	(60xx,0050)	<yes>
Overlay Bits Allocated	(60xx,0100)	<yes>
Overlay Bit Position	(60xx,0102)	<yes>
ROI Area	(60xx,1301)	<yes>
ROI Mean	(60xx,1302)	<yes>
ROI Standard Deviation	(60xx,1303)	<yes>
Overlay Label	(60xx,1500)	<yes>
Overlay Data	(60xx,3000)	<yes>
Pixel Data	(7FE0,0010)	<yes>

A.7.7 Vessel View

Somaris/5 VesselView ication will create CT result images (for SC result images see A.8). The following table provides information about image attributes created

Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	from MWL
Image Type	(0008,0008)	"DERIVED/SECONDARY/AXIAL/CSA MPR" (MPRs) or "DERIVED/SECONDARY/AXIAL/CSA MIP" (MIPs) "DERIVED/SECONDARY/AXIAL/CSA MIP THIN" (thin MIPs) "DERIVED/SECONDARY/AXIAL/CSA MPR THICK" (thick MPRs)
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UID>

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Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	(Date of Creation)
Acquisition Date	(0008,0022)	(Date of Exposure resulting in FIRST image of loaded series)
Content Date	(0008,0023)	(unknown)
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	(Time of Creation of Series Instance)
Acquisition Time	(0008,0032)	(Time of Exposure resulting in FIRST image of loaded series)
Content Time	(0008,0033)	(unknown)
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	from original
Manufacturer	(0008,0070)	“Siemens”
Institution Name	(0008,0080)	from original
Institution Address	(0008,0081)	from Site Configuration
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	Computer name
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“[ORIG] MPR Collection” for MPRs “[ORIG] MIP Collection” for MIPs “[ORIG] MPR Thick Collection” for thick MPRs “[ORIG] MIP Thin Collection” for thin MIPs (where [ORIG] is the loaded series’ description
Institutional Department Name	(0008,1040)	from Site Configuration
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	-
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	“[Product Name] Vessel View”
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>

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Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	(unknown)
> Referenced SOP Class UID	(0008,1150)	(unknown)
> Referenced SOP Instance UID	(0008,1155)	(unknown)
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	“MEDCOM RESAMPLED”
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Contrast/Bolus Agent	(0018,0010)	(unknown)
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-

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Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	from original
Slice Thickness	(0018,0050)	For MPRs: the minimum slice distance of loaded series. For MIPs: - For thick MPRs and thinMIPs: actual thickness
Scan Options	(0018,0022)	(from first loaded image)
KVP	(0018,0060)	(from first loaded image)
Data Collection Diameter	(0018,0090)	-
Device Serial Number	(0018,1000)	-
Software Version(s)	(0018,1020)	from Configuration
Protocol Name	(0018,1030)	from original
Contrast/Bolus Route	(0018,1040)	-
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	-
Reconstruction Diameter	(0018,1100)	-
Distance Source to Detector	(0018,1110)	from original
Distance Source to Patient	(0018,1111)	from original
Gantry/Detector Tilt	(0018,1120)	from original
Table Height	(0018,1130)	from original
Rotation Direction	(0018,1140)	from original
Exposure Time	(0018,1150)	-
X-Ray Tube Current	(0018,1151)	-
Exposure	(0018,1152)	-

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Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
Exposure in µAs	(0018,1153)	-
Filter Type	(0018,1160)	from original
Generator Power	(0018,1170)	from original
Focal Spot	(0018,1190)	from original
Date of last Calibration	(0018,1200)	-
Time of last Calibration	(0018,1201)	-
Convolution Kernel	(0018,1210)	from original
Patient Position	(0018,5100)	from original
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<created by system>
Acquisition Number	(0020,0012)	from original
Instance Number	(0020,0013)	(unknown)
Patient Orientation	(0020,0020)	-
Image Position (Patient)	(0020,0032)	<calculated by system>
Image Orientation (Patient)	(0020,0037)	<calculated by system>
Frame of Reference UID	(0020,0052)	from original
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	from original
Slice Location	(0020,1041)	-
Image Comments	(0020,4000)	-
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	“MONOCHROME2”
Rows	(0028,0010)	from original
Columns	(0028,0011)	from original
Pixel Spacing	(0028,0030)	<calculated by system>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	from original

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Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	0
Largest Pixel Value in Series	(0028,0109)	Modality dependent (4095 for CT)
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	Current setting when image saved
Window Width	(0028,1051)	Current setting when image saved
Rescale Intercept	(0028,1052)	Modality dependent, -1024 for CT data
Rescale Slope	(0028,1053)	1
Window Center & Width Explanation	(0028,1055)	“WINDOW1”
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
(various private data)	(0029,xxxx)	
Request Attributes Sequence	(0040,0275)	-
> Requested Procedure ID	(0040,1001)	-
> Scheduled Procedure Step ID	(0040,0009)	-
> Scheduled Procedure Step Description	(0040,0007)	-
> Scheduled Protocol Code Sequence	(0040,0008)	-
>> Code Sequence Macro		-
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	(unknown)

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Table 25: *Vessel View Result Images - CT*

Attribute Name	Tag	Value
> Image Pixel Module		
Presentation LUT Shape	(2050,0020)	-
Pixel Data	(7FE0,0010)	<created by system>

A.7.8 Volume CT

Somaris/5 Volume application will create CT result images (for SC result images see A.8). The following table provides information about image attributes created:

Table 26: *Volume CT, saved CT Images*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	<from original series or study>
Image Type	(0008,0008)	axial MIP or MinIP: “DERIVED”, “SECONDARY“, “AXIAL”, “CT_SOM5 MIP“; axial MPR: “DERIVED”, “SECONDARY“, “AXIAL”, “CT_SOM5 MPR“; coronal/sagittal MPR: “DERIVED”, “SECONDARY“, “OTHER”, “CT_SOM5 MPR“
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.2
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<date of series creation>
Acquisition Date	(0008,0022)	<from original image>
Content Date	(0008,0023)	<date of instance creation>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<time of series creation>
Acquisition Time	(0008,0032)	<from original image>
Content Time	(0008,0033)	<time of instance creation>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	“CT”
Manufacturer	(0008,0070)	<from original equipment>
Institution Name	(0008,0080)	<from original equipment>

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Table 26: *Volume CT, saved CT Images*

Attribute Name	Tag	Value
Institution Address	(0008,0081)	<from original equipment>
Referring Physician´s Name	(0008,0090)	<from original study>
Station Name	(0008,1010)	<from original equipment>
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“VolumeResult<i>” and “VolumeAxial<i>“, where <i> is an integer >= 1
Institutional Department Name	(0008,1040)	<from original equipment>
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	<from original series>
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	<from original series> + “meduser“
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	<from original equipment>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	<from original series>
> Referenced SOP Class UID	(0008,1150)	<from original series>
> Referenced SOP Instance UID	(0008,1155)	<from original series>
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	"Som5 Volume Resampled"
Source Image Sequence	(0008,2112)	<Reference to an original image>
> Referenced SOP Class UID	(0008,1150)	<Reference to an original image>
> Referenced SOP Instance UID	(0008,1155)	<Reference to an original image>
> Referenced Frame Number	(0008,1160)	-

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Table 26: *Volume CT, saved CT Images*

Attribute Name	Tag	Value
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Contrast/Bolus Agent	(0018,0010)	-
Contrast/Bolus Agent Sequence	(0018,0012)	-
> Code Sequence Macro		-
Contrast/Bolus Administration Route Sequence	(0018,0012)	-
> Code Sequence Macro		-
>Additional Drug Sequence	(0018,002A)	-
>> Code Sequence Macro		-
Body Part Examined	(0018,0015)	<from original series>
Slice Thickness	(0018,0050)	<from Volume configuration or UI>
Scan Options	(0018,0022)	<from original image>
KVP	(0018,0060)	<from original image>
Data Collection Diameter	(0018,0090)	<from original image>
Device Serial Number	(0018,1000)	<from original equipment>
Software Version(s)	(0018,1020)	<from original equipment>
Protocol Name	(0018,1030)	<from original series>
Contrast/Bolus Route	(0018,1040)	-
Contrast/Bolus Volume	(0018,1041)	-
Contrast/Bolus Start Time	(0018,1042)	-

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Table 26: *Volume CT, saved CT Images*

Attribute Name	Tag	Value
Contrast/Bolus Stop Time	(0018,1043)	-
Contrast/Bolus Total Dose	(0018,1044)	-
Contrast Flow Rate(s)	(0018,1046)	-
Contrast Flow Duration(s)	(0018,1047)	-
Contrast/Bolus Ingredient	(0018,1048)	-
Contrast/Bolus Ingredient Concentration	(0018,1049)	-
Spatial Resolution	(0018,1050)	<from original equipment>
Reconstruction Diameter	(0018,1100)	<from original image>
Distance Source to Detector	(0018,1110)	<from original image>
Distance Source to Patient	(0018,1111)	<from original image>
Gantry/Detector Tilt	(0018,1120)	<from original image>
Table Height	(0018,1130)	<from original image>
Rotation Direction	(0018,1140)	<from original image>
Exposure Time	(0018,1150)	<from original image>
X-Ray Tube Current	(0018,1151)	<from original image>
Exposure	(0018,1152)	<from original image>
Exposure in µAs	(0018,1153)	-
Filter Type	(0018,1160)	<from original image>
Generator Power	(0018,1170)	<from original image>
Focal Spot	(0018,1190)	<from original image>
Date of last Calibration	(0018,1200)	<from original equipment>
Time of last Calibration	(0018,1201)	<from original equipment>
Convolution Kernel	(0018,1210)	<first value from original image>
Patient Position	(0018,5100)	<from original series>
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<(highest available ID + 1)>
Acquisition Number	(0020,0012)	<from original image>
Instance Number	(0020,0013)	axial MIP/MPR: 1 coronal MPR: 2 sagittal MPR: 3 current axial image: 5
Patient Orientation	(0020,0020)	-

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Table 26: *Volume CT, saved CT Images*

Attribute Name	Tag	Value
Image Position (Patient)	(0020,0032)	<calculated by application>
Image Orientation (Patient)	(0020,0037)	<calculated by application>
Frame of Reference UID	(0020,0052)	<from original series>
Laterality	(0020,0060)	<from original series>
Images in Acquisition	(0020,1002)	-
Position Reference Indicator	(0020,1040)	<from original series>
Slice Location	(0020,1041)	axial MIP/MPR: <calculated by application> coronal/sagittal MPR: -
Image Comments	(0020,4000)	<from original image, or null length if not available>
Samples per Pixel	(0028,0002)	<from original image>
Photometric Interpretation	(0028,0004)	<from original image>
Rows	(0028,0010)	<from original image>
Columns	(0028,0011)	<from original image>
Pixel Spacing	(0028,0030)	<from original image, or calculated by application>
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	<from original image>
Bits Stored	(0028,0101)	<from original image>
High Bit	(0028,0102)	<from original image>
Pixel Representation	(0028,0103)	<from original image>
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	<from original equipment>
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	<from current widow setting in UI>
Window Width	(0028,1051)	<from current widow setting in UI>
Rescale Intercept	(0028,1052)	<from original images>
Rescale Slope	(0028,1053)	<from original images>
Window Center & Width Explanation	(0028,1055)	“WINDOW1”
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-

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Table 26: *Volume CT, saved CT Images*

Attribute Name	Tag	Value
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Requested Procedure Description	(0032,1060)	
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	<from original series>
Performed Procedure Step Start Date	(0040,0244)	<from original series>
Performed Procedure Step Start Time	(0040,0245)	<from original series>
Performed Procedure Step Description	(0040,0254)	<from original series>
Performed Protocol Code Sequence	(0040,0260)	<from original series>
> Code Sequence Macro		<from original series>
Comments on the Performed Procedure Step	(0040,0280)	<from original series>
Icon Image Sequence	(0088,0200)	(unknown) -
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	<image rows (normally 512)>
Overlay Columns	(60xx,0011)	<image colums (normally 512)>
Number of Frames in Overlay	(60xx,0015)	1
Overlay Description	(60xx,0022)	“Siemens MedCom Object Graphics“ or -
Overlay Type	(60xx,0040)	“G”
Overlay Subtype	(60xx,0045)	-
Origin	(60xx,0050)	“1”, “1”
Image Frame Origin	(60xx,0051)	“1”
Overlay Origin	(60xx,0060)	-
Overlay Bits Allocated	(60xx,0100)	1
Overlay Bit Position	(60xx,0102)	0
ROI Area	(60xx,1301)	-

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Table 26: Volume CT, saved CT Images

Attribute Name	Tag	Value
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	<binary data>
Pixel Data	(7FE0,0010)	<binary data>

A.8 SC Standard Extended SOP Class

The Somaris/5 application will create functional images from special applications. Those will be encoded as SC Standard extended SOP Class. Please see the following tables for a selected overview of supplied Standard and Private attributes.

A.8.1 Dental CT

Somaris/5 Dental application will create SC result images (for CT result images see A.5). The following table provides information about image attributes created

Table 27: CT Dental

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	Paraxial Reformats = "DERIVED", "SECONDARY", "OTHER", "CT_SOM5 DPAR" Panorama Reformats = "DERIVED", "SECONDARY", "OTHER", "CT_SOM5 DPAN"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	yes
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	yes
Acquisition Date	(0008,0022)	yes
Content Date	(0008,0023)	yes
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	yes
Acquisition Time	(0008,0032)	yes

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Table 27: *CT Dental*

Attribute Name	Tag	Value
Content Time	(0008,0033)	yes
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	yes
Conversion Type	(0008,0064)	"WSD"
Manufacturer	(0008,0070)	yes
Institution Name	(0008,0080)	yes
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	yes
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	e.g.:"Paraxial3", "Panorama3"
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	yes
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	yes
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-

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Table 27: CT Dental

Attribute Name	Tag	Value
Source Image Sequence	(0008,2112)	yes
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	-
Source Image Sequence	(0008,2112)	101
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	-
Device Serial Number	(0018,1000)	yes
Secondary Capture Device ID	(0018,1010)	0
Date of Secondary Capture	(0018,1012)	yes
Time of Secondary Capture	(0018,1014)	yes
Secondary Capture Device Manufacturer	(0018,1016)	"Seimens"
Secondary Capture Device Manufacturer’s Model Name	(0018,1018)	"ModelName"
Secondary Capture Device Software Version	(0018,1019)	"SoftwareVersion"
Software Version(s)	(0018,1020)	-
Video Image Format Acquired	(0018,1022)	-
Digital Image Format Acquired	(0018,1023)	-
Protocol Name	(0018,1030)	-

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Table 27: *CT Dental*

Attribute Name	Tag	Value
Spatial Resolution	(0018,1050)	-
Date of last Calibration	(0018,1200)	yes
Time of last Calibration	(0018,1201)	yes
Patient Position	(0018,5100)	yes
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	yes
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	yes
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	yes
Patient Orientation	(0020,0020)	0
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Image Comments	(0020,4000)	yes
Samples per Pixel	(0028,0002)	yes
Photometric Interpretation	(0028,0004)	yes
Rows	(0028,0010)	yes
Columns	(0028,0011)	yes
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	yes
Bits Stored	(0028,0101)	yes
High Bit	(0028,0102)	yes
Pixel Representation	(0028,0103)	yes
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	yes
Window Width	(0028,1051)	yes
Rescale Intercept	(0028,1052)	yes

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Table 27: *CT Dental*

Attribute Name	Tag	Value
Rescale Slope	(0028,1053)	yes
Rescale Type	(0028,1054)	“HU”
Window Center & Width Explanation	(0028,1055)	yes
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	yes
Overlay Columns	(60xx,0011)	yes
Number of Frames in Overlay	(60xx,0015)	“1”

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Table 27: *CT Dental*

Attribute Name	Tag	Value
Overlay Description	(60xx,0022)	“Siemens MedCom Object Graphics"
Overlay Subtype	(60xx,0045)	-
Overlay Type	(60xx,0040)	yes
Overlay Origin	(60xx,0050)	yes
Image Frame Origin	(60xx,0051)	yes
Overlay Bits Allocated	(60xx,0100)	yes
Overlay Bit Position	(60xx,0102)	yes
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	yes
Pixel Data	(7FE0,0010)	yes

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A.8.2 DynEva

Somaris/5 DynEva application will create SC result images (for CT result images see A.5). The following table provides information about image attributes created:

Table 28: *DynEva created SC Images*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	"DERIVED", "SECONDARY", "OTHER", "CSA BLACK IMAGE"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	date of series creation
Acquisition Date	(0008,0022)	-
Content Date	(0008,0023)	date of content creation
Acquisition Datetime	(0008,002A)	-

Table 28: *DynEva created SC Images*

Attribute Name	Tag	Value
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	time of series creation
Acquisition Time	(0008,0032)	-
Content Time	(0008,0033)	time of content creation
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	CT
Conversion Type	(0008,0064)	WSD
Manufacturer	(0008,0070)	Siemens
Institution Name	(0008,0080)	(taken from the local config)
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	name of computer
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“DynEva Curves+<Examination Number>”, “DynEva Parameters+<Examination Number>”
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	from original
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	from original
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>

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Table 28: *DynEva created SC Images*

Attribute Name	Tag	Value
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	Som5 DynEva Resampled
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Private Creator	(0009,00xx)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	(source unknown)
Device Serial Number	(0018,1000)	taken from the local config
Secondary Capture Device ID	(0018,1010)	-
Date of Secondary Capture	(0018,1012)	date of SC creation
Time of Secondary Capture	(0018,1014)	time of SC creation
Secondary Capture Device Manufacturer	(0018,1016)	-
Secondary Capture Device Manufacturer’s Model Name	(0018,1018)	-
Secondary Capture Device Software Version	(0018,1019)	-

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Table 28: *DynEva created SC Images*

Attribute Name	Tag	Value
Software Version(s)	(0018,1020)	set to the current version (source unknown)
Video Image Format Acquired	(0018,1022)	-
Digital Image Format Acquired	(0018,1023)	-
Protocol Name	(0018,1030)	protocolname of the current series
Spatial Resolution	(0018,1050)	-
Patient Position	(0018,5100)	position of the patient
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<highest series number + 1>
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	1 (source unknown)
Patient Orientation	(0020,0020)	created by application
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Image Comments	(0020,4000)	-
Private Creator	(0021,00xx)	-
Target	(0021,xx11)	-
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	MONOCHROME2
Rows	(0028,0010)	512
Columns	(0028,0011)	512
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-

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Table 28: *DynEva created SC Images*

Attribute Name	Tag	Value
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	-
Window Width	(0028,1051)	-
Rescale Intercept	(0028,1052)	-
Rescale Slope	(0028,1053)	-
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	“WINDOW1”
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Pixel Padding Value	(0028,1020)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-

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Table 28: *DynEva created SC Images*

Attribute Name	Tag	Value
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	-
Overlay Columns	(60xx,0011)	-
Overlay Description	(60xx,0022)	-
Overlay Subtype	(60xx,0045)	-
Overlay Type	(60xx,0040)	-
Overlay Origin	(60xx,0050)	-
Overlay Bits Allocated	(60xx,0100)	-
Overlay Bit Position	(60xx,0102)	-
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	-
Pixel Data	(7FE0,0010)	binary (524288 bytes)

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A.8.3 InSpace

Somaris/5 InSpace application will create SC result images. The following table provides information about image attributes created:

Table 29: *InSpace*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	from Original
Image Type	(0008,0008)	“DERIVED\SECONDARY\OTHER\CSA 3DPROJECTION”
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	<new UId>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<yyyymmdd>
Acquisition Date	(0008,0022)	-

Table 29: *InSpace*

Attribute Name	Tag	Value
Content Date	(0008,0023)	<yyyymmdd>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<hhmmss>
Acquisition Time	(0008,0032)	-
Content Time	(0008,0033)	<hhmmss>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	CT
Conversion Type	(0008,0064)	WSD
Manufacturer	(0008,0070)	“HipGraphics”
Institution Name	(0008,0080)	from Configuration
Institution Address	(0008,0081)	from Configuration
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	from WS Configuration
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	
Institutional Department Name	(0008,1040)	from Original
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	(input only via "Correct")
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	-
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	from Original
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>

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Table 29: *InSpace*

Attribute Name	Tag	Value
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	“MEDCOM RESAMPLED”
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	-
Device Serial Number	(0018,1000)	from Configuration
Secondary Capture Device ID	(0018,1010)	from Configuration
Date of Secondary Capture	(0018,1012)	<yyyymmdd>
Time of Secondary Capture	(0018,1014)	<hhmmss>
Secondary Capture Device Manufacturer	(0018,1016)	“HipGraphics”
Secondary Capture Device Manufacturer’s Model Name	(0018,1018)	“InSpace Postprocessing”
Secondary Capture Device Software Version	(0018,1019)	“VB10”

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Table 29: *InSpace*

Attribute Name	Tag	Value
Software Version(s)	(0018,1020)	from WS Configuration
Video Image Format Acquired	(0018,1022)	-
Digital Image Format Acquired	(0018,1023)	-
Protocol Name	(0018,1030)	-
Spatial Resolution	(0018,1050)	-
Patient Position	(0018,5100)	-
Private Creator	(0019,00xx)	-
Feed per Rotation	(0019,xxB0)	-
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UId>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	from Original
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	from Original
Patient Orientation	(0020,0020)	
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Image Comments	(0020,4000)	
Private Creator	(0021,00xx)	-
Target	(0021,xx11)	-
Samples per Pixel	(0028,0002)	3
Photometric Interpretation	(0028,0004)	RGB
Rows	(0028,0010)	
Columns	(0028,0011)	
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	8
Bits Stored	(0028,0101)	8
High Bit	(0028,0102)	7
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-

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Table 29: *InSpace*

Attribute Name	Tag	Value
Pixel Padding Value	(0028,0120)	from Original
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	-
Window Width	(0028,1051)	-
Rescale Intercept	(0028,1052)	-
Rescale Slope	(0028,1053)	-
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	-
Red Palette Color Lookup Table Descriptor	(0028,1101)	-
Green Palette Color Lookup Table Descriptor	(0028,1102)	-
Blue Palette Color Lookup Table Descriptor	(0028,1103)	-
Red Palette Color Lookup Table Data	(0028,1201)	-
Green Palette Color Lookup Table Data	(0028,1202)	-
Blue Palette Color Lookup Table Data	(0028,1203)	-
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-

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Table 29: *InSpace*

Attribute Name	Tag	Value
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	-
Overlay Columns	(60xx,0011)	-
Overlay Description	(60xx,0022)	-
Overlay Subtype	(60xx,0045)	-
Overlay Type	(60xx,0040)	-
Overlay Origin	(60xx,0050)	-
Overlay Bits Allocated	(60xx,0100)	-
Overlay Bit Position	(60xx,0102)	-
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	-
Pixel Data	(7FE0,0010)	

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A.8.4 Lung Care Result

Somaris/5 Lung Care will create SC result images (for CT result images see A.5). They are not intended for viewing but for reporting purposes - and they can be stored/transferred via DICOM. The following table provides information about image attributes created:

Table 30: *CT LungCARE - Result*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	<yes>

Table 30: *CT LungCARE - Result*

Attribute Name	Tag	Value
Image Type	(0008,0008)	“DERIVED\SECONDARY\OTHER\MPR” or “DERIVED\SECONDARY\OTHER\MIP” or “DERIVED\SECONDARY\OTHER\PVRT”
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	<new UId>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	-
Acquisition Date	(0008,0022)	<yes>
Content Date	(0008,0023)	<yes>
Acquisition Datetime	(0008,002A)	
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	-
Acquisition Time	(0008,0032)	<yes>
Content Time	(0008,0033)	<yes>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	“SC”
Conversion Type	(0008,0064)	
Manufacturer	(0008,0070)	“Siemens Med CT”
Institution Name	(0008,0080)	<yes>
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	
Station Name	(0008,1010)	-
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	e.g. “SCREENING #1_report” or “SCREENING #1_result_1_3_SPI” or “SCREENING #1_result_1_4_MPR”
Institutional Department Name	(0008,1040)	

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Table 30: *CT LungCARE - Result*

Attribute Name	Tag	Value
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	<yes>
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	<yes>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Derivation Description	(0008,2111)	
Source Image Sequence	(0008,2112)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>

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Table 30: *CT LungCARE - Result*

Attribute Name	Tag	Value
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	
Device Serial Number	(0018,1000)	
Secondary Capture Device ID	(0018,1010)	
Date of Secondary Capture	(0018,1012)	
Time of Secondary Capture	(0018,1014)	
Secondary Capture Device Manufacturer	(0018,1016)	
Secondary Capture Device Manufacturer’s Model Name	(0018,1018)	
Secondary Capture Device Software Version	(0018,1019)	
Software Version(s)	(0018,1020)	<yes>
Video Image Format Acquired	(0018,1022)	
Digital Image Format Acquired	(0018,1023)	
Protocol Name	(0018,1030)	
Spatial Resolution	(0018,1050)	
Patient Position	(0018,5100)	
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UId>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<yes>
Acquisition Number	(0020,0012)	
Instance Number	(0020,0013)	
Patient Orientation	(0020,0020)	
Laterality	(0020,0060)	
Images in Acquisition	(0020,1002)	
Image Comments	(0020,4000)	
Samples per Pixel	(0028,0002)	1 or 3
Photometric Interpretation	(0028,0004)	“MONOCHROME2” or “RGB”
Rows	(0028,0010)	512

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Table 30: *CT LungCARE - Result*

Attribute Name	Tag	Value
Columns	(0028,0011)	512
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16 or 8
Bits Stored	(0028,0101)	12 or 8
High Bit	(0028,0102)	11 or 7
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	-400\50
Window Width	(0028,1051)	1200\400
Rescale Intercept	(0028,1052)	- or -1024
Rescale Slope	(0028,1053)	- or 1
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	WINDOW1\WINDOW2
Lossy Image Compression	(0028,2110)	
Lossy Image Compression Ratio	(0028,2112)	
Modality LUT Sequence	(0028,3000)	
> LUT Descriptor	(0028,3002)	
> LUT Explanation	(0028,3003)	
>Modality LUT Type	(0028,3004)	
> LUT Data	(0028,3006)	
VOI LUT Sequence	(0028,3010)	
> LUT Descriptor	(0028,3002)	
> LUT Explanation	(0028,3003)	
> LUT Data	(0028,3006)	
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>

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Table 30: *CT LungCARE - Result*

Attribute Name	Tag	Value
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	
Performed Procedure Step Start Date	(0040,0244)	
Performed Procedure Step Start Time	(0040,0245)	
Performed Procedure Step Description	(0040,0254)	
Performed Protocol Code Sequence	(0040,0260)	
> Code Sequence Macro		
Comments on the Performed Procedure Step	(0040,0280)	
Icon Image Sequence	(0088,0200)	
> Image Pixel Module		
Presentation LUT Shape	(2050,0020)	
Overlay Rows	(60xx,0010)	
Overlay Columns	(60xx,0011)	
Overlay Description	(60xx,0022)	
Overlay Subtype	(60xx,0045)	
Overlay Type	(60xx,0040)	
Overlay Origin	(60xx,0060)	
Overlay Bits Allocated	(60xx,0100)	
Overlay Bit Position	(60xx,0102)	
ROI Area	(60xx,1301)	
ROI Mean	(60xx,1302)	
ROI Standard Deviation	(60xx,1303)	
Overlay Label	(60xx,1500)	
Overlay Data	(60xx,3000)	
Pixel Data	(7FE0,0010)	<yes>

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A.8.5 Lung Care Report

Somaris/5 Lung Care will create SC result images (for CT result images see A.5). They are not intended for viewing but for reporting purposes - and they can be stored/transferred via DICOM. The following table provides information about image attributes created:

Table 31: *CT LungCARE - Report*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	<yes>
Image Type	(0008,0008)	“DERIVED\SECONDARY\OTHER\REPORT" Type 5: "IN_WORK” or "FINISHED"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	<new UId>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	-
Acquisition Date	(0008,0022)	<yes>
Content Date	(0008,0023)	<yes>
Acquisition Datetime	(0008,002A)	
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	-
Acquisition Time	(0008,0032)	<yes>
Content Time	(0008,0033)	<yes>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	“SC”
Conversion Type	(0008,0064)	
Manufacturer	(0008,0070)	“Siemens Med CT”
Institution Name	(0008,0080)	<yes>
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	-
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	e.g. “SCREENING #1_report”

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Table 31: *CT LungCARE - Report*

Attribute Name	Tag	Value
Institutional Department Name	(0008,1040)	
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	<yes>
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	<yes>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Derivation Description	(0008,2111)	
Source Image Sequence	(0008,2112)	
> Referenced SOP Class UID	(0008,1150)	
> Referenced SOP Instance UID	(0008,1155)	
> Referenced Frame Number	(0008,1160)	
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>

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Table 31: *CT LungCARE - Report*

Attribute Name	Tag	Value
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	
Device Serial Number	(0018,1000)	
Secondary Capture Device ID	(0018,1010)	
Date of Secondary Capture	(0018,1012)	
Time of Secondary Capture	(0018,1014)	
Secondary Capture Device Manufacturer	(0018,1016)	
Secondary Capture Device Manufacturer’s Model Name	(0018,1018)	
Secondary Capture Device Software Version	(0018,1019)	
Software Version(s)	(0018,1020)	<yes>
Video Image Format Acquired	(0018,1022)	
Digital Image Format Acquired	(0018,1023)	
Protocol Name	(0018,1030)	
Spatial Resolution	(0018,1050)	
Patient Position	(0018,5100)	-
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UId>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<yes>
Acquisition Number	(0020,0012)	
Instance Number	(0020,0013)	
Patient Orientation	(0020,0020)	-
Laterality	(0020,0060)	
Images in Acquisition	(0020,1002)	
Image Comments	(0020,4000)	
Samples per Pixel	(0028,0002)	3
Photometric Interpretation	(0028,0004)	“RGB”

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Table 31: *CT LungCARE - Report*

Attribute Name	Tag	Value
Rows	(0028,0010)	64
Columns	(0028,0011)	64
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0300)	-
Window Center	(0028,1050)	100
Window Width	(0028,1051)	100
Rescale Intercept	(0028,1052)	-
Rescale Slope	(0028,1053)	-
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	-
Pixel Padding Value	(0028,1020)	
Lossy Image Compression	(0028,2110)	
Lossy Image Compression Ratio	(0028,2112)	
Modality LUT Sequence	(0028,3000)	
> LUT Descriptor	(0028,3002)	
> LUT Explanation	(0028,3003)	
>Modality LUT Type	(0028,3004)	
> LUT Data	(0028,3006)	
VOI LUT Sequence	(0028,3010)	
> LUT Descriptor	(0028,3002)	
> LUT Explanation	(0028,3003)	
> LUT Data	(0028,3006)	
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>

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Table 31: *CT LungCARE - Report*

Attribute Name	Tag	Value
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	
Performed Procedure Step Start Date	(0040,0244)	
Performed Procedure Step Start Time	(0040,0245)	
Performed Procedure Step Description	(0040,0254)	
Performed Protocol Code Sequence	(0040,0260)	
> Code Sequence Macro		
Comments on the Performed Procedure Step	(0040,0280)	
Icon Image Sequence	(0088,0200)	
> Image Pixel Module		
Presentation LUT Shape	(2050,0020)	
Pixel Data	(7FE0,0010)	<yes>

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A.8.6 Osteo

Somaris/5 Osteo will create SC result images (for CT result images see A.5). The following table provides information about image attributes created:

Table 32: *Osteo - SC Image*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	ISO_IR 100
Image Type	(0008,0008)	"DERIVED", "SECONDARY", "OTHER", "CSA BLACK IMAGE"
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	<new UId>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<Date of series creation>
Acquisition Date	(0008,0022)	-

Table 32: *Osteo - SC Image*

Attribute Name	Tag	Value
Content Date	(0008,0023)	<Date of image creation>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<Time of series creation>
Acquisition Time	(0008,0032)	-
Content Time	(0008,0033)	<Time of image creation>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	CT
Conversion Type	(0008,0064)	WSD
Manufacturer	(0008,0070)	SIEMENS
Institution Name	(0008,0080)	-
Institution Address	(0008,0081)	-
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	-
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	< one of: Contours, Tables, Summary>
Institutional Department Name	(0008,1040)	-
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	-
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	-
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>

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Table 32: *Osteo - SC Image*

Attribute Name	Tag	Value
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	-
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	-
Device Serial Number	(0018,1000)	-
Secondary Capture Device ID	(0018,1010)	-
Date of Secondary Capture	(0018,1012)	<Date of instance creation>
Time of Secondary Capture	(0018,1014)	<Time of instance creation>
Secondary Capture Device Manufacturer	(0018,1016)	-
Secondary Capture Device Manufacturer’s Model Name	(0018,1018)	-
Secondary Capture Device Software Version	(0018,1019)	-

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Table 32: *Osteo - SC Image*

Attribute Name	Tag	Value
Software Version(s)	(0018,1020)	-
Video Image Format Acquired	(0018,1022)	-
Digital Image Format Acquired	(0018,1023)	-
Protocol Name	(0018,1030)	-
Spatial Resolution	(0018,1050)	-
Patient Position	(0018,5100)	-
Private Creator	(0019,00xx)	-
Feed per Rotation	(0019,xxB0)	-
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UId>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<last existing series + 1>
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	-
Patient Orientation	(0020,0020)	-
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Image Comments	(0020,4000)	-
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	MONOCHROME2
Rows	(0028,0010)	512
Columns	(0028,0011)	512
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-

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Table 32: *Osteo - SC Image*

Attribute Name	Tag	Value
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	-
Window Width	(0028,1051)	-
Rescale Intercept	(0028,1052)	-
Rescale Slope	(0028,1053)	-
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	-
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	-
> Image Pixel Module		-

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Table 32: *Osteo - SC Image*

Attribute Name	Tag	Value
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	<yes>
Overlay Columns	(60xx,0011)	<yes>
Overlay Description	(60xx,0022)	-
Overlay Subtype	(60xx,0045)	<yes>
Overlay Type	(60xx,0040)	<yes>
Overlay Origin	(60xx,0050)	<yes>
Overlay Bits Allocated	(60xx,0100)	<yes>
Overlay Bit Position	(60xx,0102)	<yes>
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	<yes>
Pixel Data	(7FE0,0010)	<created by system>

A.8.7 Vessel View

Somaris/5 VesselView ication will create SC result images (for CT result images see A.5). The following table provides information about image attributes created:

Table 33: *VesselView - SC result image*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	“ISO_IR 100”
Image Type	(0008,0008)	"DERIVED/SECONDARY/OTHER/CSA RIBBON/CSA MPR CURVED” (VN images) or “DERIVED/SECONDARY/OTHER/CSA VRT/VVMANIP-ULATED” (VRTs) or “DERIVED/SECONDARY/MPR/CSA MPR" (axial cuts) or "DERIVED/SECONDARY/OTHER/CSA BLACK IMAGE" (reports)
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7

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Table 33: *VesselView - SC result image*

Attribute Name	Tag	Value
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<date of series creation>
Acquisition Date	(0008,0022)	(Date of Exposure resulting in FIRST image of loaded series)
Content Date	(0008,0023)	(unknown)
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<time of series creation>
Acquisition Time	(0008,0032)	(Time of Exposure resulting in FIRST image of loaded series)
Content Time	(0008,0033)	<time of instance creation>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	from original
Conversion Type	(0008,0064)	“WSD”
Manufacturer	(0008,0070)	Siemens
Institution Name	(0008,0080)	<from original equipment>
Institution Address	(0008,0081)	(from Site Configuration)
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	Computer name
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“[ORIG] RENDERINGS Collection” for VRT and VN or “[ORIG] REPORTS Collection” for reports or “[ORIG] ANGIOMPRS Collection” for axial cuts (where [ORIG] is the loaded series’ description
Institutional Department Name	(0008,1040)	<from configuration>
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	-
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	“meduser“
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	“[Product Name] Vessel View”

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Table 33: *VesselView - SC result image*

Attribute Name	Tag	Value
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	(unknown)
> Referenced SOP Class UID	(0008,1150)	(unknown)
> Referenced SOP Instance UID	(0008,1155)	(unknown)
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	“MEDCOM RESAMPLED”
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>
Additional Patient’s History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	<from original series>

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Table 33: *VesselView - SC result image*

Attribute Name	Tag	Value
Device Serial Number	(0018,1000)	-
Secondary Capture Device ID	(0018,1010)	Computer name
Date of Secondary Capture	(0018,1012)	First loaded image's acquisition date
Time of Secondary Capture	(0018,1014)	First loaded image's acquisition time
Secondary Capture Device Manufacturer	(0018,1016)	Siemens
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	[Product Name] Vessel View
Secondary Capture Device Software Version	(0018,1019)	[Product Version] (e.g "VA60A-W")
Software Version(s)	(0018,1020)	From configuration
Video Image Format Acquired	(0018,1022)	-
Digital Image Format Acquired	(0018,1023)	-
Protocol Name	(0018,1030)	<from original series>
Spatial Resolution	(0018,1050)	-
Date of Last Calibration	(0018,1200)	
Time of Last Calibration	(0018,1201)	
Patient Position	(0018,5100)	<from original series>
Private Creator	(0019,00xx)	-
Feed per Rotation	(0019,xxB0)	-
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<created by system>
Acquisition Number	(0020,0012)	from original
Instance Number	(0020,0013)	(unknown)
Patient Orientation	(0020,0020)	Orientation of image for VRT and VN, else -
Laterality	(0020,0060)	-
Images in Acquisition	(0020,1002)	-
Image Comments	(0020,4000)	-
Samples per Pixel	(0028,0002)	3 for VN and VRT (color images) 1 for axial cuts (b/w images) and reports (black images)
Photometric Interpretation	(0028,0004)	"RGB" for VN and VRT "MONOCHROME2" for axial cuts and reports

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Table 33: *VesselView - SC result image*

Attribute Name	Tag	Value
Rows	(0028,0010)	512 for VRT depending on ribbon size for VN 512 for reports (black images) 256 for axial cuts
Columns	(0028,0011)	512 for VRT depending on ribbon size for VN 512 for reports (black images) 256 for axial cuts
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16 for axial cuts and reports 8 for VN and VRT
Bits Stored	(0028,0101)	12 for axial cuts and reports 8 for VN and VRT
High Bit	(0028,0102)	11 for axial cuts and reports 7 for VN and VRT
Pixel Representation	(0028,0103)	from original
Smallest Image Pixel Value	(0028,0106)	“0” for reports, - otherwise
Largest Image Pixel Value	(0028,0107)	“0” for reports, - otherwise
Smallest Pixel Value in Series	(0028,0108)	0
Largest Pixel Value in Series	(0028,0109)	Modality dependent (4095 for CT) for reports and axial cuts 0 for VN and VRT
Pixel Padding Value	(0028,0120)	-
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	Current setting when image saved (for VN and axial cuts), 100 (for VRT and reports)
Window Width	(0028,1051)	Current setting when image saved (for VN and axial cuts), 100 (for VRT and reports)
Rescale Intercept	(0028,1052)	-
Rescale Slope	(0028,1053)	-
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	-
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-

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Table 33: *VesselView - SC result image*

Attribute Name	Tag	Value
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Requested Procedure Description	(0032,1060)	
Request Attributes Sequence	(0040,0275)	-
> Requested Procedure ID	(0040,1001)	-
> Scheduled Procedure Step ID	(0040,0009)	-
> Scheduled Procedure Step Description	(0040,0007)	-
> Scheduled Protocol Code Sequence	(0040,0008)	-
>> Code Sequence Macro		-
Performed Procedure Step ID	(0040,0253)	-
Performed Procedure Step Start Date	(0040,0244)	-
Performed Procedure Step Start Time	(0040,0245)	-
Performed Procedure Step Description	(0040,0254)	-
Performed Protocol Code Sequence	(0040,0260)	-
> Code Sequence Macro		-
Comments on the Performed Procedure Step	(0040,0280)	-
Icon Image Sequence	(0088,0200)	(unknown) -
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Pixel Data	(7FE0,0010)	<binary data>

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A.8.8 Volume CT

Somaris/5 Volume application will create SC result images (for CT result images see A.5). The following table provides information about image attributes created:

Table 34: *Volume CT, Result Image (CSA BLACK IMAGE)*

Attribute Name	Tag	Value
Specific Character Set	(0008,0005)	“ISO_IR 100”

Table 34: *Volume CT, Result Image (CSA BLACK IMAGE)*

Attribute Name	Tag	Value
Image Type	(0008,0008)	“DERIVED”, “SECONDARY”, “OTHER”, “CSA BLACK IMAGE”
Instance Creation Date	(0008,0012)	-
Instance Creation Time	(0008,0013)	-
Instance Creator UID	(0008,0014)	-
SOP Class UID	(0008,0016)	1.2.840.10008.5.1.4.1.1.7
SOP Instance UID	(0008,0018)	<new UID>
Study Date	(0008,0020)	<as Original>
Series Date	(0008,0021)	<date of series creation>
Acquisition Date	(0008,0022)	-
Content Date	(0008,0023)	<date of instance creation>
Acquisition Datetime	(0008,002A)	-
Study Time	(0008,0030)	<as Original>
Series Time	(0008,0031)	<time of series creation>
Acquisition Time	(0008,0032)	-
Content Time	(0008,0033)	<time of instance creation>
Accession Number	(0008,0050)	<as Original>
Modality	(0008,0060)	“CT”
Conversion Type	(0008,0064)	“WSD”
Manufacturer	(0008,0070)	<from original equipment>
Institution Name	(0008,0080)	<from original equipment>
Institution Address	(0008,0081)	<from original equipment>
Referring Physician´s Name	(0008,0090)	<as Original>
Station Name	(0008,1010)	<from original equipment>
Study Description	(0008,1030)	<as Original>
Procedure Code Sequence	(0008,1032)	<as Original>
> (Code Sequence Macro)		<as Original>
Series Description	(0008,103E)	“VolumeResult<i>”, where <i> is an integer >= 1
Institutional Department Name	(0008,1040)	<from original equipment>
Physician(s) of Record	(0008,1048)	<as Original>
Performing Physicians´ Name	(0008,1050)	<from original series>
Name of Physician(s) Reading Study	(0008,1060)	<as Original>
Operator´s Name	(0008,1070)	<from original series> + “meduser“

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Table 34: *Volume CT, Result Image (CSA BLACK IMAGE)*

Attribute Name	Tag	Value
Admitting Diagnoses Description	(0008,1080)	<as Original>
Manufacturer´s Model Name	(0008,1090)	<from original equipment>
Referenced Study Sequence	(0008,1110)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Study Component Sequence	(0008,1111)	<from original series>
> Referenced SOP Class UID	(0008,1150)	<from original series>
> Referenced SOP Instance UID	(0008,1155)	<from original series>
Referenced Patient Sequence	(0008,1120)	<as Original>
> Referenced SOP Class UID	(0008,1150)	<as Original>
> Referenced SOP Instance UID	(0008,1155)	<as Original>
Referenced Image Sequence	(0008,1140)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Derivation Description	(0008,2111)	-
Source Image Sequence	(0008,2112)	-
> Referenced SOP Class UID	(0008,1150)	-
> Referenced SOP Instance UID	(0008,1155)	-
> Referenced Frame Number	(0008,1160)	-
Private Creator	(0009,00xx)	-
Patient´s Name	(0010,0010)	<as Original>
Patient ID	(0010,0020)	<as Original>
Patient´s Birth Date	(0010,0030)	<as Original>
Patient´s Birth Time	(0010,0032)	<as Original>
Patient´s Sex	(0010,0040)	<as Original>
Other Patient IDs	(0010,1000)	<as Original>
Other Patient Names	(0010,1001)	<as Original>
Patient´s Age	(0010,1010)	<as Original>
Patient´s Size	(0010,1020)	<as Original>
Patient‘s Weight	(0010,1030)	<as Original>
Ethnic Group	(0010,2160)	<as Original>
Occupation	(0010,2180)	<as Original>

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Table 34: *Volume CT, Result Image (CSA BLACK IMAGE)*

Attribute Name	Tag	Value
Additional Patient's History	(0010,21B0)	<as Original>
Patient Comments	(0010,4000)	<as Original>
Body Part Examined	(0018,0015)	<from original series>
Device Serial Number	(0018,1000)	<from original equipment>
Secondary Capture Device ID	(0018,1010)	-
Date of Secondary Capture	(0018,1012)	<date of instance creation> ?
Time of Secondary Capture	(0018,1014)	<date of instance creation> ?
Secondary Capture Device Manufacturer	(0018,1016)	-
Secondary Capture Device Manufacturer's Model Name	(0018,1018)	-
Secondary Capture Device Software Version	(0018,1019)	-
Software Version(s)	(0018,1020)	<from original equipment>
Video Image Format Acquired	(0018,1022)	-
Digital Image Format Acquired	(0018,1023)	-
Protocol Name	(0018,1030)	<from original series>
Spatial Resolution	(0018,1050)	<from original equipment>
Date of Last Calibration	(0018,1200)	<from original equipment>
Time of Last Calibration	(0018,1201)	<from original equipment>
Patient Position	(0018,5100)	<from original series>
Study Instance UID	(0020,000D)	<as Original>
Series Instance UID	(0020,000E)	<new UID>
Study ID	(0020,0010)	<as Original>
Series Number	(0020,0011)	<(highest available ID + 1)>
Acquisition Number	(0020,0012)	-
Instance Number	(0020,0013)	4
Patient Orientation	(0020,0020)	(null length)
Laterality	(0020,0060)	<from original series>
Images in Acquisition	(0020,1002)	-
Image Comments	(0020,4000)	-
Samples per Pixel	(0028,0002)	1
Photometric Interpretation	(0028,0004)	MONOCHROME2
Rows	(0028,0010)	512
Columns	(0028,0011)	512

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Table 34: *Volume CT, Result Image (CSA BLACK IMAGE)*

Attribute Name	Tag	Value
Pixel Aspect Ratio	(0028,0034)	-
Bits Allocated	(0028,0100)	16
Bits Stored	(0028,0101)	12
High Bit	(0028,0102)	11
Pixel Representation	(0028,0103)	0
Smallest Image Pixel Value	(0028,0106)	-
Largest Image Pixel Value	(0028,0107)	-
Smallest Pixel Value in Series	(0028,0108)	-
Largest Pixel Value in Series	(0028,0109)	-
Pixel Padding Value	(0028,0120)	<from original equipment>
Quality Control Image	(0028,0300)	-
Burned In Annotation	(0028,0301)	-
Window Center	(0028,1050)	-
Window Width	(0028,1051)	-
Rescale Intercept	(0028,1052)	-
Rescale Slope	(0028,1053)	-
Rescale Type	(0028,1054)	-
Window Center & Width Explanation	(0028,1055)	“WINDOW1“
Lossy Image Compression	(0028,2110)	-
Lossy Image Compression Ratio	(0028,2112)	-
Modality LUT Sequence	(0028,3000)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
>Modality LUT Type	(0028,3004)	-
> LUT Data	(0028,3006)	-
VOI LUT Sequence	(0028,3010)	-
> LUT Descriptor	(0028,3002)	-
> LUT Explanation	(0028,3003)	-
> LUT Data	(0028,3006)	-
Requested Procedure Description	(0032,1060)	
Request Attributes Sequence	(0040,0275)	<as Original>
> Requested Procedure ID	(0040,1001)	<as Original>
> Scheduled Procedure Step ID	(0040,0009)	<as Original>

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Table 34: *Volume CT, Result Image (CSA BLACK IMAGE)*

Attribute Name	Tag	Value
> Scheduled Procedure Step Description	(0040,0007)	<as Original>
> Scheduled Protocol Code Sequence	(0040,0008)	<as Original>
>> Code Sequence Macro		<as Original>
Performed Procedure Step ID	(0040,0253)	<from original series>
Performed Procedure Step Start Date	(0040,0244)	<from original series>
Performed Procedure Step Start Time	(0040,0245)	<from original series>
Performed Procedure Step Description	(0040,0254)	<from original series>
Performed Protocol Code Sequence	(0040,0260)	<from original series>
> Code Sequence Macro		<from original series>
Comments on the Performed Procedure Step	(0040,0280)	<from original series>
Icon Image Sequence	(0088,0200)	(unknown) -
> Image Pixel Module		-
Presentation LUT Shape	(2050,0020)	-
Overlay Rows	(60xx,0010)	512
Overlay Columns	(60xx,0011)	512
Number of Frames in Overlay	(60xx,0015)	1
Overlay Description	(60xx,0022)	“Siemens MedCom Object Graphics“
Overlay Type	(60xx,0040)	“G”
Overlay Subtype	(60xx,0045)	-
Origin	(60xx,0050)	“1”, “1”
Image Frame Origin	(60xx,0051)	“1”
Overlay Origin	(60xx,0050)	-
Overlay Bits Allocated	(60xx,0100)	1
Overlay Bit Position	(60xx,0102)	0
ROI Area	(60xx,1301)	-
ROI Mean	(60xx,1302)	-
ROI Standard Deviation	(60xx,1303)	-
Overlay Label	(60xx,1500)	-
Overlay Data	(60xx,3000)	<binary data>
Pixel Data	(7FE0,0010)	<binary data>

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A.9 Private Non-Image SOP Class

The Med-WS will create numerical data that cannot be correlated to an individual image instance and therefore need to be stored in separate instance(s). This is necessary to correlate the information in the right level of the DICOM data model hierarchy. Since there is no fitting DICOM SOP Class definition, SIEMENS has created a private "Non-Image IOD" to contain numerical data heaps to be managed within a DICOM structure. Please see previous chapters of this Annex for IOD definition and the following tables for detailed encoding of the different "Non-Image SOP Class Instances".

A.9.1 InSpace "Bookmark files"

Table 35: *overview of supplied attributes - NON-image from InSpaceIS "bookmark file"*

Attribute Name	Tag	Value
Specific Character Set	[0008,0005]	from Original
Image Type	[0008,0008]	ORIGINAL\PRIMARY\OTHER\CSA BOOKMARK
SOP Class UID	[0008,0016]	1.3.12.2.1107.5.9.1
SOP Instance UID	[0008,0018]	
Study Date	[0008,0020]	from Original
Series Date	[0008,0021]	<yyyymmdd>
Image Date	[0008,0023]	<yyyymmdd>
Study Time	[0008,0030]	from Original
Series Time	[0008,0031]	<hhmmss>
Image Time	[0008,0033]	<hhmmss>
Accession Number	[0008,0050]	from Original
Modality	[0008,0060]	CT
Manufacturer	[0008,0070]	from WS configuration
Institution Name	[0008,0080]	from WS configuration
Institution Address	[0008,0081]	from WS configuration
Referring Physician´s Name	[0008,0090]	from Original
Station Name	[0008,1010]	from WS configuration
Study Description	[0008,1030]	from Original
Series Description	[0008,103E]	
Performing Physicians´ Name	[0008,1050]	input via "Correct"
Manufacturer´s Model Name	[0008,1090]	from Original
Patient´s Name	[0010,0010]	from Original

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Table 35: *overview of supplied attributes - NON-image from InSpaceIS "bookmark file"*

Attribute Name	Tag	Value
Patient ID	[0010,0020]	from Original
Patient´s Birth Date	[0010,0030]	from Original
Patient´s Sex	[0010,0040]	from Original
Patient´s Age	[0010,1010]	from Original
Device Serial Number	[0018,1000]	from Original
Software Versions	[0018,1020]	from Original + "\<WS version>"
Study Instance UID	[0020,000D]	from Original
Series Instance UID	[0020,000E]	
Study ID	[0020,0010]	from Original
Series Number	[0020,0011]	
Image Number	[0020,0013]	
Image Comments	[0020,4000]	
<private data>	[0029,xxxx]	<see NON-Image definitions in this Annex)
Private Creator	[7FE1,0010]	SIEMENS CSA NON-IMAGE
Non-Image Data	[7FE1,1010]	<non-image type data>

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A.10 DICOM Print SCU - detailed status displays

The following tables document the behavior of the LEONARDO DICOM Print AE in response to messages received for the printer SOP class and the print job SOP class.

A.10.1 Common Status Information

Table 36: *Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class*

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/ camera symbol
NORMAL	Camera is ready.	Camera is ready.	<None>/idle
BAD RECEIVE MGZ	There is a problem with the film receive magazine. Films from the printer cannot be transported into the magazine.	Problem with receive magazine.	<None>/interact

Table 36: *Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class*

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/ camera symbol**
BAD SUPPLY MGZ	There is a problem with a film supply magazine. Films from this magazine cannot be transported into the printer.	Problem with supply magazine.	<None>/interact
CALIBRATING	Printer is performing self calibration, it is expected to be available for normal operation shortly.	Self calibration. Please wait.	<None>/idle
CALIBRATION ERR	An error in the printer calibration has been detected, quality of processed films may not be optimal.	Problem in calibration. Film quality may not be optimal.	<None>/interact
CHECK CHEMISTRY	A problem with the processor chemicals has been detected, quality of processed films may not be optimal.	Problem with chemistry. Film quality may not be optimal.	<None>/interact
CHECK SORTER	There is an error in the film sorter	Error in film sorter.	<None>/interact
CHEMICALS EMPTY	There are no processing chemicals in the processor, films will not be printed and processed until the processor is back to normal.	Camera chemistry empty. Please check.	<None>/interact
CHEMICALS LOW	The chemical level in the processor is low, if not corrected, it will probably shut down soon.	Camera chemistry low. Please check.	<None>/interact
COVER OPEN	One or more printer or processor covers, drawers, doors are open.	Camera cover, drawer or door open.	<None>/interact
ELEC CONFIG ERR	Printer configured improperly for this job.	Camera configured improperly for this job. Queue stopped.	Queue for this camera will be STOPPED/Queue stopped
ELEC DOWN	Printer is not operating due to some unspecified electrical hardware problem.	Camera electrical hardware problem.	<None>/interact
ELEC SW ERROR	Printer not operating for some unspecified software error.	Camera software problem. Queue stopped.	Queue for this camera will be STOPPED/queue stopped
EMPTY 8x10	The 8x10 inch film supply magazine is empty.	8x10 film supply empty.	<None>/interact
EMPTY 8x10 BLUE	The 8x10 inch blue film supply magazine is empty.	8x10 blue film supply empty.	<None>/interact
EMPTY 8x10 CLR	The 8x10 inch clear film supply magazine is empty.	8x10 clear film supply empty.	<None>/interact
EMPTY 8x10 PAPR	The 8x10 inch paper supply magazine is empty.	8x10 paper supply empty.	<None>/interact
EMPTY 10x12	The 10x12 inch film supply magazine is empty.	10x12 film supply empty.	<None>/interact

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Table 36: Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class

Printer Status info/Execution Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/ camera symbol
EMPTY 10x12 BLUE	The 10x12 inch blue film supply magazine is empty.	10x12 blue film supply empty.	<None>/interact
EMPTY 10x12 CLR	The 10x12 inch clear film supply magazine is empty.	10x12 clear film supply empty.	<None>/interact
EMPTY 10x12 PAPR	The 10x12 inch paper supply magazine is empty.	10x12 paper supply empty.	<None>/interact
EMPTY 10x14	The 10x14 inch film supply magazine is empty.	10x14 film supply empty.	<None>/interact
EMPTY 10x14 BLUE	The 10x14 inch blue film supply magazine is empty.	10x14 blue film supply empty.	<None>/interact
EMPTY 10x14 CLR	The 10x14 inch clear film supply magazine is empty.	10x14 clear film supply empty.	<None>/interact
EMPTY 10x14 PAPR	The 10x14 inch paper supply magazine is empty.	10x14 paper supply empty.	<None>/interact
EMPTY 11x14	The 11x14 inch film supply magazine is empty.	11x14 film supply empty.	<None>/interact
EMPTY 11x14 BLUE	The 11x14 inch blue film supply magazine is empty.	11x14 blue film supply empty.	<None>/interact
EMPTY 11x14 CLR	The 11x14 inch clear film supply magazine is empty.	11x14 clear film supply empty.	<None>/interact
EMPTY 11x14 PAPR	The 11x14 inch paper supply magazine is empty.	11x14 paper supply empty.	<None>/interact
EMPTY 14x14	The 14x14 inch film supply magazine is empty.	14x14 film supply empty.	<None>/interact
EMPTY 14x14 BLUE	The 14x14 inch blue film supply magazine is empty.	14x14 blue film supply empty.	<None>/interact
EMPTY 14x14 CLR	The 14x14 inch clear film supply magazine is empty.	14x14 clear film supply empty.	<None>/interact
EMPTY 14x14 PAPR	The 14x14 inch paper supply magazine is empty.	14x14 paper supply empty.	<None>/interact
EMPTY 14x17	The 14x17 inch film supply magazine is empty.	14x17 film supply empty.	<None>/interact
EMPTY 14x17 BLUE	The 14x17 inch blue film supply magazine is empty.	14x17 blue film supply empty.	<None>/interact
EMPTY 14x17 CLR	The 14x17 inch clear film supply magazine is empty.	14x17 clear film supply empty.	<None>/interact
EMPTY 14x17 PAPR	The 14x17 inch paper supply magazine is empty.	14x17 paper supply empty.	<None>/interact
EMPTY 24x24	The 24x24 inch film supply magazine is empty.	24x24 film supply empty.	<None>/interact

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Table 36: *Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class*

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/ camera symbol**
EMPTY 24x24 BLUE	The 24x24 inch blue film supply magazine is empty.	24x24 blue film supply empty.	<None>/interact
EMPTY 24x24 CLR	The 24x24 inch clear film supply magazine is empty.	24x24 clear film supply empty.	<None>/interact
EMPTY 24x24 PAPR	The 24x24 inch paper supply magazine is empty.	24x24 paper supply empty.	<None>/interact
EMPTY 24x30	The 24x30 inch film supply magazine is empty.	24x30 film supply empty.	<None>/interact
EMPTY 24x30 BLUE	The 24x30 inch blue film supply magazine is empty.	24x30 blue film supply empty.	<None>/interact
EMPTY 24x30 CLR	The 24x30 inch clear film supply magazine is empty.	24x30 clear film supply empty.	<None>/interact
EMPTY 24x30 PAPR	The 24x30 inch paper supply magazine is empty.	24x30 paper supply empty.	<None>/interact
EMPTY A4 PAPR	The A4 paper supply magazine is empty.	A4 paper supply empty.	<None>/interact
EMPTY A4 TRANS	The A4 transparency supply magazine is empty.	A4 transparency supply empty.	<None>/interact
EXPOSURE FAILURE	The exposure device has failed due to some unspecified reason.	Exposure device has failed.	<None>/interact
FILM JAM	A film transport error has occurred and a film is jammed in the printer or processor.	Film jam.	<None>/interact
FILM TRANSP ERR	There is a malfunction with the film transport, there may or may not be a film jam.	Film transport problem.	<None>/interact
FINISHER EMPTY	The finisher is empty.	Finisher is empty.	<None>/interact
FINISHER ERROR	The finisher is not operating due to some unspecified reason.	Finisher problem.	<None>/interact
FINISHER LOW	The finisher is low on supplies	Finisher low.	<None>/interact
LOW 8x10	The 8x10 inch film supply magazine is low.	8x10 film supply low.	<None>/interact
LOW 8x10 BLUE	The 8x10 inch blue film supply magazine is low.	8x10 blue film supply low.	<None>/interact
LOW 8x10 CLR	The 8x10 inch clear film supply magazine is low.	8x10 clear film supply low.	<None>/interact
LOW 8x10 PAPR	The 8x10 inch paper supply magazine is low.	8x10 paper supply low.	<None>/interact

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Table 36: *Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class*

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/ camera symbol**
LOW 10x12	The 10x12 inch film supply magazine is low.	10x12 film supply low.	<None>/interact
LOW 10x12 BLUE	The 10x12 inch blue film supply magazine is low.	10x12 blue film supply low.	<None>/interact
LOW 10x12 CLR	The 10x12 inch clear film supply magazine is low.	10x12 clear film supply low.	<None>/interact
LOW 10x12 PAPR	The 10x12 inch paper supply magazine is low.	10x12 paper supply low.	<None>/interact
LOW 10x14	The 10x14 inch film supply magazine is low.	10x14 film supply low.	<None>/interact
LOW 10x14 BLUE	The 10x14 inch blue film supply magazine is low.	10x14 blue film supply low.	<None>/interact
LOW 10x14 CLR	The 10x14 inch clear film supply magazine is low.	10x14 clear film supply low.	<None>/interact
LOW 10x14 PAPR	The 10x14 inch paper supply magazine is low.	10x14 paper supply low.	<None>/interact
LOW 11x14	The 11x14 inch film supply magazine is low.	11x14 film supply low.	<None>/interact
LOW 11x14 BLUE	The 11x14 inch blue film supply magazine is low.	11x14 blue film supply low.	<None>/interact
LOW 11x14 CLR	The 11x14 inch clear film supply magazine is low.	11x14 clear film supply low.	<None>/interact
LOW 11x14 PAPR	The 11x14 inch paper supply magazine is low.	11x14 paper supply low.	<None>/interact
LOW 14x14	The 14x14 inch film supply magazine is low.	14x14 film supply low.	<None>/interact
LOW 14x14 BLUE	The 14x14 inch blue film supply magazine is low.	14x14 blue film supply low.	<None>/interact
LOW 14x14 CLR	The 14x14 inch clear film supply magazine is low.	14x14 clear film supply low.	<None>/interact
LOW 14x14 PAPR	The 14x14 inch paper supply magazine is low.	14x14 paper supply low.	<None>/interact
LOW 14x17	The 14x17 inch film supply magazine is low.	14x17 film supply low.	<None>/interact
LOW 14x17 BLUE	The 14x17 inch blue film supply magazine is low.	14x17 blue film supply low.	<None>/interact
LOW 14x17 CLR	The 14x17 inch clear film supply magazine is low.	14x17 clear film supply low.	<None>/interact
LOW 14x17 PAPR	The 14x17 inch paper supply magazine is low.	14x17 paper supply low.	<None>/interact

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Table 36: *Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class*

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/ camera symbol**
LOW 24x24	The 24x24 inch film supply magazine is low.	24x24 film supply low.	<None>/interact
LOW 24x24 BLUE	The 24x24 inch blue film supply magazine is low.	24x24 blue film supply low.	<None>/interact
LOW 24x24 CLR	The 24x24 inch clear film supply magazine is low.	24x24 clear film supply low.	<None>/interact
LOW 24x24 PAPR	The 24x24 inch paper supply magazine is low.	24x24 paper supply low.	<None>/interact
LOW 24x30	The 24x30 inch film supply magazine is low.	24x30 film supply low.	<None>/interact
LOW 24x30 BLUE	The 24x30 inch blue film supply magazine is low.	24x30 blue film supply low.	<None>/interact
LOW 24x30 CLR	The 24x30 inch clear film supply magazine is low.	24x30 clear film supply low.	<None>/interact
LOW 24x30 PAPR	The 24x30 inch paper supply magazine is low.	24x30 paper supply low.	<None>/interact
LOW A4 PAPR	The A4 paper supply magazine is low.	A4 paper supply low.	<None>/interact
LOW A4 TRANS	The A4 transparency supply magazine is low.	A4 transparency supply low.	<None>/interact
NO RECEIVE MGZ	The film receive magazine no available.	Film receiver not available.	<None>/interact
NO RIBBON	The ribbon cartridge needs to be replaced.	Replace ribbon cartridge.	<None>/interact
NO SUPPLY MGZ	The film supply magazine specified for this job is not available.	Film supply not available.	<None>/interact
CHECK PRINTER	The printer is not ready at this time, operator intervention is required to make the printer available.	Check camera.	<None>/interact
CHECK PROC	The processor is not ready at this time, operator intervention is required to make the printer available.	Check processor.	<None>/interact
PRINTER DOWN	The printer is not operating due to some unspecified reason.	Camera down.	<None>/interact
PRINTER INIT	The printer is not ready at this time, it is expected to become available without intervention, For example, it may be in a normal warm-up state.	Camera initializing.	<None>/idle

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Table 36: *Printer Status Infos within Printer SOP Class/Execution Status Infos within Print Job SOP Class*

Printer Status info/Execution Status info	**Description**	**Message string visible in the Status Bar**	**Other action for *syngo*/ camera symbol**
PRINTER OFFLINE	The printer has been disabled by an operator or service person.	Camera off-line.	<None>/interact
PROC DOWN	The processor is not operating due to some unspecified reason.	Processor down.	<None>/interact
PROC INIT	The processor is not ready at this time, it is expected to become available without intervention. For example, it may be in a normal warm-up state.	Processor initializing.	<None>/idle
PROC OVERFLOW FL	Processor chemicals are approaching the overflow full mark.	Processor chemicals overflow.	<None>/interact
PROC OVERFLOW HI	Processor chemicals have reached the overflow full mark.	Processor chemicals near overflow.	<None>/interact
QUEUED	Print job in Queue	-	<None>/idle
RECEIVER FULL	The Film receive magazine is full.	Receiver full.	<None>/interact
REQ MED NOT INST	The requested film, paper, or other media supply magazine is installed in the printer, but may be available with operator intervention.	Install media supply.	<None>/interact
REQ MED NOT AVAI	The requested film, paper, or other media requested is not available on this printer.	Media supply not available on this camera. Queue stopped. Change camera.	Queue for this camera will be STOPPED/queue stopped
RIBBON ERROR	There is an unspecified problem with the print ribbon.	Error with print ribbon.	<None>/interact
SUPPLY EMPTY	The printer is out of film.	Camera out of film.	<None>/interact
SUPPLY LOW	The film supply is low.	Film supply low.	<None>/interact
UNKNOWN	There is an unspecified problem.	Unspecified problem with camera.	<None>/interact

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A.10.2 Additional Status Information - AGFA Printers

Table 37: *Printer Status Infos: Additional Agfa printer status infos*

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/ camera symbol
WARMING UP	Printer is in the warm-up stage. Spooling of print jobs to disk is still possible.	Camera is warming up.	<None>idle
OFFLINE	Printer is switched off-line. Spooling of print jobs to disk is still possible.	Camera is switched off-line.	<None>/interact
NONE	General printer warning, no specific information is available. Spooling of print jobs to disk is still possible.	-	<None>/idle
-	-	-	-

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A.10.3 Additional Status Information - Kodak PACS Link (formerly Imation)

Table 38: *Printer Status Infos: Additional Kodak infos for Pacs Link (formerly Imation cameras)*

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/ camera symbol
SUPPLY MGZ ERR	The supply magazine has an error.	Film supply has an error.	<None>/interact
-	-	-	-

A.10.4 Additional Status Information - Kodak 190l

Table 39: *Printer Status Infos: Additional Kodak infos for Kodak 190*

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/ camera symbol
PRINTER STOPPED	The printer has stopped	Camera has stopped.	<None>/interact
FATAL ERROR	Fatal error.	Fatal error. Queue stopped.	Queue for this camera will be STOPPED/queue stopped
-	-	-	-

A.10.5 Additional Status Information - Kodak 2180/1120

Table 40: *Printer Status Infos: Additional Kodak infos for 2180/1120*

Printer Status info	Description	Message string visible in the Status Bar	Other action for *syngo*/ camera symbol
PRINTER NOT RDY	Printer not ready.	Camera not ready.	<None>/interact
CHECK PRO-CESSOR	Check processor.	Check processor.	<None>/interact
NO TONER	No toner.	No toner.	<None>/interact
FATAL	Fatal error.	Fatal error. Queue stopped.	Queue for this camera will be STOPPED/queue stopped
-	-	-	-

A.10.6 Additional Status Information - Codonics

Table 41: *Printer Status Infos: Additional Codonics infos*

Printer Status info	Description	Message string visible in the Status Bar	Other action for syngo/ camera symbol
STANDARD	Printer is ready.	Camera is ready.	<None>/Normal
LOAD A-SIZE	Load A-size media.	Load A-size media.	<None>/interact
LOAD A-DVPA-PER	Load A-size black and white paper.	Load A-size black and white paper.	<None>/interact
LOAD A-CVPA-PER	Load A-size color paper.	Load A-size color paper.	<None>/interact
LOAD A-CVTRANS	Load A-size transparencies.	Load A-size transparencies.	<None>/interact
LOAD A4-SIZE	Load A4-size media.	Load A4-size media.	<None>/interact
LOAD A4-DVPA-PER	Load A4-size black and white paper.	Load A4-size black and white paper.	<None>/interact
LOAD A4-CVPA-PER	Load A4-size color paper.	Load A4-size color paper.	<None>/interact
LOAD A4-CVTRANS	Load A4-size transparencies.	Load A4-size transparencies.	<None>/interact
LOAD LA-SIZE	Load LA-size media.	Load LA-size media.	<None>/interact
LOAD LA-DVPAPER	Load LA-size black and white paper.	Load LA-size black and white paper.	<None>/interact
LOAD LA-CVPAPER	Load LA-size color paper.	Load LA-size color paper.	<None>/interact
LOAD LA-CVTRANS	Load LA-size transparencies.	Load LA-size transparencies.	<None>/interact

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Table 41: *Printer Status Infos: Additional Codonics infos*

Printer Status info	Description	Message string visible in the Status Bar	Other action for syngo/ camera symbol
LOAD LA4-SIZE	Load LA4-size media.	Load LA4-size media.	<None>/interact
LOAD LA4-DVPAPER	Load LA4-size black and white paper.	Load LA4-size black and white paper.	<None>/interact
LOAD LA4-CVPAPER	Load LA4-size color paper.	Load LA4-size color paper.	<None>/interact
LOAD LA4-CVTRANS	Load LA4-size transparencies.	Load LA4-size transparencies.	<None>/interact
LOAD XLA-SIZE	Load XLA-size media.	Load XLA-size media.	<None>/interact
LOAD XLA-DVPAPER	Load XLA-size black and white paper.	Load XLA-size black and white paper.	<None>/interact
LOAD XLA-CVPAPER	Load XLA-size color paper.	Load XLA-size color paper.	<None>/interact
LOAD XLA-CVTRANS	Load XLA-size transparencies.	Load XLA-size transparencies.	<None>/interact
LOAD XLA4-SIZE	Load XLA4-size media.	Load XLA4-size media.	<None>/interact
LOAD XLA4-DVPAPE	Load XLA4-size black and white paper.	Load XLA4-size black and white paper.	<None>/interact
LOAD XLA4-CVPAPE	Load XLA4-size color paper.	Load XLA4-size color paper.	<None>/interact
LOAD XLA4-CVTRAN	Load XLA4-size transparencies.	Load XLA4-size transparencies.	<None>/interact
LOAD XLW-SIZE	Load XLW-size media.	Load XLW-size media.	<None>/interact
LOAD XLW-DVPAPER	Load XLW-size black and white paper.	Load XLW-size black and white paper.	<None>/interact
LOAD XLW-CVPAPER	Load XLW-size color paper.	Load XLW-size color paper.	<None>/interact
LOAD 8X10-SIZE	Load 8x10 media.	Load 8x10 media.	<None>/interact
LOAD 8X10-DVFILM	Load 8x10 black and white film.	Load 8x10 black and white film.	<None>/interact
SUPPLY MISSING	The film supply magazine specified for this job is not available.	Film supply not available.	<None>/interact
RIBBON MISSING	Ribbon is missing.	Ribbon is missing.	<None>/interact
RIBBON EMPTY	Ribbon is empty.	Ribbon is empty.	<None>/interact
TOP COVER OPEN	Top cover of printer is open.	Top cover of camera is open.	<None>/interact
-	-	-	-

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A.10.7 Additional DICOM Execution Status Information

Table 42: *Additional DICOM Execution Status Infos*

Execution Status info	Description	Message string visible in the Status Bar	Other action for syngo/ camera symbol
INVALID PAGE DES	The specified page layout cannot be printed or other page description errors have been detected.	Film Job cannot be printed on this camera. Queue stopped. Please redirect film job.	Queue for this camera will be STOPPED/queue stopped
INSUFFIC MEMORY	There is not enough memory available to complete this job.	Not enough memory available in camera. Queue stopped. Please continue queue or change camera.	Queue for this camera will be STOPPED/queue stopped
NONE	General printer warning, no specific information is available. Spooling of print jobs to disk is still possible.	-	<None>/idle

A.11 DICOM Conformance Statement e.soft 3.0 *syngo*

see attached document e.soft_DICOM3.0ConformStmt.pdf

A.12 DICOM Conformance Statement VSIM

see attached document VSIM_CONFUMN.pdf

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